

**PERMIT ATTACHMENT M1**

**CONTAINER STORAGE**

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## PERMIT ATTACHMENT M1

### CONTAINER STORAGE

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## PERMIT ATTACHMENT M1

### CONTAINER STORAGE

#### Introduction

Management and storage of transuranic (**TRU**) mixed waste in the Waste Isolation Pilot Plant (**WIPP**) facility is subject to regulation under Title 20 of the New Mexico Administrative Code, Chapter 4, Part 1 (20.4.1 NMAC), Subpart V. The technical requirements of 20.4.1.500 NMAC (incorporating 40 CFR §§264.170 to 264.178 are applied to the operation of the Waste Handling Building Container Storage Unit (**WHB Unit**)(Figure M1-1), and the Parking Area Container Storage Unit (**Parking Area Unit**)(Figure M1-2). This Permit Attachment describes the container storage units, the TRU mixed waste management facilities and operations, and compliance with the technical requirements of 20.4.1 NMAC. The configuration of the WIPP facility consists of completed structures, including all buildings and systems for the operation of the facility.

#### M1-1 Container Storage

The waste containers that will be used at the WIPP facility qualify as "containers," in accordance with 20.4.1.101 NMAC (incorporating 40 CFR §260.10). That is, they are "portable devices in which a material is stored, transported, treated, disposed of, or otherwise handled."

#### M1-1a Containers with Residual Liquids

The Permit Treatment, Storage, and Disposal Facility (**TSDF**) Waste Acceptance Criteria (**WAC**) and the Waste Analysis Plan (Permit Attachment B) prohibit the shipment of liquid waste to the WIPP. This prohibition is enforced as a maximum residual liquids requirement. In no case shall the total liquid equal or exceed one volume percent of the waste container (e.g., drum or standard waste box [**SWB**]). Since the maximum amount of liquid is one percent, calculations made to determine the secondary containment as required by 20.4.1.500 NMAC (incorporating §264.175) are based on ten percent of one percent of the volume of the containers, or one percent of the largest container, whichever is greater.

#### M1-1b Description of Containers

20.4.1.500 NMAC (incorporating 40 CFR §264.171) requires that containers holding waste be in good condition. Waste containers shall be in good condition prior to shipment from the generator sites, i.e., containers will be of high integrity, intact, and free of surface contamination above DOE limits. The Manager of the DOE Carlsbad Field Office has the authority to suspend a generator's certification to ship TRU mixed waste to the WIPP facility should the generator fail to meet this requirement. The containers will be certified free of surface contamination above DOE limits upon shipment. This condition shall be verified upon receipt of the waste at WIPP. The level of rigor applied in these areas to ensure container integrity and the absence of external contamination on both ends of the transportation process will ensure that waste containers entering the waste management process line at WIPP meet the applicable Resource Conservation and Recovery Act (**RCRA**) requirements for container condition.

Contact handled (**CH**) TRU mixed waste containers will be either 55-gal (208-L) drums singly or arranged into 7-packs, 85-gal (321-L) drums singly or arranged into 4-packs, 100-gal (379 L) drums singly or arranged into 3-packs, ten-drum overpacks (**TDOP**), or SWBs. A summary description of each container type is provided below.

#### Standard 55-Gallon Drums

Standard 55-gal (208-L) drums meet the requirements for U.S. Department of Transportation (**DOT**) specification 7A regulations.

A standard 55-gal (208-L) drum has a gross internal volume of 7.4 cubic feet (ft<sup>3</sup>) (0.210 cubic meters (m<sup>3</sup>)). Figure M1-3 shows a standard TRU mixed waste drum. One or more filtered vents (as described in Section M1-1d(1)) will be installed in the drum lid to prevent the escape of any radioactive particulates and to eliminate any potential of pressurization.

Standard 55-gal (208-L) drums are constructed of mild steel and may also contain rigid, molded polyethylene (or other compatible material) liners. These liners are procured to a specification describing the functional requirements of fitting inside the drum, material thickness and tolerances, and quality controls and required testing. A quality assurance surveillance program is applied to all procurements to verify that the liners meet the specification.

Standard 55-gal (208-L) drums may be used to collect derived waste.

#### Standard Waste Boxes

The SWBs meet all the requirements of DOT specification 7A regulations.

One or more filtered vents (as described in Section M1-1d(1)) will be installed in the SWB body and located near the top of the SWB to prevent the escape of any radioactive particulates and to eliminate any potential of pressurization. They have an internal volume of 66.3 ft<sup>3</sup> (1.88 m<sup>3</sup>). Figure M1-4 shows a SWB.

The SWB is the largest container that may be used to collect derived waste.

#### Ten-Drum Overpack

The TDOP is a metal container, similar to a SWB, that meets DOT specification 7A and is certified to be noncombustible and to meet all applicable requirements for Type A packaging. The TDOP is a welded-steel, right circular cylinder, approximately 74 inches (in.) (1.9 meters (m)) high and 71 in. (1.8 m) in diameter (Figure M1-5). The maximum loaded weight of a TDOP is 6,700 pounds (lbs) (3,040 kilograms (kg)). A bolted lid on one end is removable; sealing is accomplished by clamping a neoprene gasket between the lid and the body. One or more filter vents are located near the top of the TDOP on the body to prevent the escape of any radioactive particulates and to eliminate any potential of pressurization. A TDOP may contain up to ten standard 55-gal (208-L) drums or one SWB. TDOPs may be used to overpack drums or SWBs containing CH TRU mixed waste. The TDOP may also be direct loaded with CH TRU mixed waste. Figure M1-5 shows a TDOP.

### Eighty-Five Gallon Drum

The 85-gal (321-L) drums meet the requirements for DOT specification 7A regulations. One or more filtered vents (as described in Section M1-1d(1)) will be installed in the 85-gal drum to prevent the escape of any radioactive particulates and to eliminate any potential of pressurization.

85-gal (321-L) drums are constructed of mild steel and may also contain rigid, molded polyethylene (or other compatible material) liners. These liners are procured to a specification describing the functional requirements of fitting inside the drum, material thickness and tolerances, and quality controls and required testing. A quality assurance surveillance program is applied to all procurements to verify that the liners meet the specification.

The 85-gal (321-L) drum, which is shown in Figure M1-6, will be used for overpacking contaminated 55-gal (208 L) drums at the WIPP facility. The 85-gal drum may also be direct loaded with CH TRU mixed waste.

85-gal (321-L) drums may be used to collect derived waste.

### 100-Gallon Drum

100-gal (379-L) drums meet the requirements for DOT specification 7A regulations.

A 100-gal (379-L) drum has a gross internal volume of 13.4 ft<sup>3</sup> (0.38 m<sup>3</sup>). One or more filtered vents (as described in Section M1-1d(1)) will be installed in the drum lid or body to prevent the escape of any radioactive particulates and to eliminate any potential of pressurization.

100-gal (379-L) drums are constructed of mild steel and may also contain rigid, molded polyethylene (or other compatible material) liners. These liners are procured to a specification describing the functional requirements of fitting inside the drum, material thickness and tolerances, and quality controls and required testing. A quality assurance surveillance program is applied to all procurements to verify that the liners meet the specification.

100-gal (379-L) drums may be direct loaded.

### Container Compatibility

All containers will be made of steel, and some will contain rigid, molded polyethylene liners. The compatibility study, documented in Appendix C1 of the WIPP RCRA Part B Permit Application (DOE, 1997a), included container materials to assure containers are compatible with the waste. Therefore, these containers meet the requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.172).

1 M1-1c Description of the Container Storage Units

2 M1-1c(1) Waste Handling Building Container Storage Unit (WHB Unit)

3 The Waste Handling Building (**WHB**) is the surface facility where TRU mixed waste handling  
4 activities will take place (Figure M1-1). The WHB has a total area of approximately 84,000  
5 square feet (ft<sup>2</sup>) (7,804 square meters (m<sup>2</sup>)) of which 33,175 ft<sup>2</sup> (3,082 m<sup>2</sup>) are designated for the  
6 waste handling and container storage of CH TRU mixed waste, as shown in Figure M1-1. This  
7 area is being permitted as the WHB Unit. The concrete floors are sealed with a coating that is  
8 sufficiently impervious to the chemicals in TRU mixed waste to meet the requirements of  
9 20.4.1.500 NMAC (incorporating 40 CFR §264.175(b)(1)).

10 The Contact Handled Packages used to transport TRU mixed waste containers will be received  
11 through one of three air-lock entries to the CH Bay of the WHB Unit. The WHB heating,  
12 ventilation and air conditioning (**HVAC**) system maintains the interior of the WHB at a pressure  
13 lower than the ambient atmosphere to ensure that air flows into the WHB, preventing the  
14 inadvertent release of any hazardous or radioactive constituents contamination as the result of  
15 a contamination event. The doors at each end of the air lock are interlocked to prevent both  
16 from opening simultaneously and equalizing CH Bay pressure with outside atmospheric  
17 pressure. The CH Bay houses two TRUPACT-II Docks (**TRUDOCKs**), each equipped with  
18 overhead cranes for opening and unloading Contact Handled Packages. The TRUDOCKs are  
19 within the TRUDOCK Storage Area of the WHB Unit.

20 The cranes are rated to lift the Contact Handled Packaging lids as well as their contents. The  
21 cranes are designed to remain on their tracks and hold their load even in the event of a design-  
22 basis earthquake.

23 Upon receipt and removal of CH TRU mixed waste containers from the Contact Handled  
24 Packaging, the waste containers are required to be in good condition as provided in Permit  
25 Module III. The waste containers will be visually inspected for physical damage (severe rusting,  
26 apparent structural defects, signs of pressurization, etc.) and leakage to ensure they are good  
27 condition prior to storage. Waste containers will also be checked for external surface  
28 contamination. If a primary waste container is not in good condition, the Permittees will  
29 overpack the container, repair/patch the container in accordance with 49 CFR §173 and §178  
30 (e.g., 49 CFR §173.28), or return the container to the generator. The Permittees may initiate  
31 local decontamination, return unacceptable containers to a DOE generator site or send the  
32 Contact Handled Package to the third party contractor. Decontamination activities will not be  
33 conducted on containers which are not in good condition, or which are leaking. If local  
34 decontamination activities are opted for, the work will be conducted in the WHB Unit on the  
35 TRUDOCK. These processes are described in Section M1-1d. The area previously designated  
36 as the Overpack and Repair Room will not be used for TRU mixed waste management in any  
37 instances.

38 Once unloaded from the Contact Handled Packaging, CH TRU mixed waste containers (7-  
39 packs, 3-packs, 4-packs, SWBs, or TDOPs) are placed in one of two positions on the facility  
40 pallet. The waste containers are stacked, on the facility pallets (one- or two-high, depending on  
41 weight considerations). The use of facility pallets will elevate the waste at least 6 in. (15 cm)  
42 from the floor surface. Pallets of waste will then be relocated to the Northeast (**NE**) Storage

Area of the WHB Unit for normal storage. This NE Storage Area, which is shown in Figure M1-7, will be clearly marked to indicate the lateral limits of the storage area. This NE Storage Area will have a maximum capacity of seven pallets (1,856 ft<sup>3</sup> [52.6 m<sup>3</sup>]) of TRU mixed waste containers during normal operations. These pallets will typically be staged in this area for a period of up to five days.

In addition, four Contact Handled Packages, containing up to eight 7-packs, 3-packs, 4-packs, SWBs, or four TDOPs, may occupy the staging positions at the TRUDOCK Storage Area of the WHB Unit. If waste containers are left in this area, they will be in the Contact Handled Package with or without the shipping container lids removed. The maximum volume of waste in containers in four Contact Handled Packages is 530.4 ft<sup>3</sup> (15 m<sup>3</sup>).

The Derived Waste Storage Area of the WHB Unit is on the north wall of the CH Bay. This area will contain containers up to the volume of a SWB for collecting derived waste from all TRU mixed waste handling processes in the WHB Unit. The Derived Waste Storage Area is being permitted to allow containers in size up to a SWB to be used to accumulate derived waste. The volume of TRU mixed waste stored in this area will be up to 66.3 ft<sup>3</sup> (1.88 m<sup>3</sup>). The derived waste containers in the Derived Waste Storage Area will be stored on standard drum pallets, which are polyethylene trays with a grated deck, which will elevate the derived waste containers approximately 6 in. (15 cm) from the floor surface, and provide approximately 50 gal (190 L) of secondary containment capacity.

An area has also been designated for the temporary storage of waste containers for which manifest discrepancies were noted after the Contact Handled Package was opened. Discrepant payloads will be placed either in the Shielded Storage Area of the WHB Unit on a facility pallet or inside a Contact Handled Package, depending on when the discrepancy is discovered. In either case the waste containers will be elevated approximately six inches from the floor surface. The storage capacity of this area is one pallet load of TRU mixed waste containers (i.e., 4 SWBs, 2 TDOPs, or 28 drums, or combinations of all three).

Aisle space shall be maintained in all WHB Unit TRU mixed waste storage areas. The aisle space shall be adequate to allow unobstructed movement of fire-fighting personnel, spill-control equipment, and decontamination equipment that would be used in the event of an off-normal event. An aisle space of 44 in. (1.1 m) between facility pallets will be maintained in all WHB Unit TRU mixed waste storage areas.

The WHB has been designed to meet DOE design and associated quality assurance requirements. Table M1-1 summarizes basic design requirements, principal codes, and standards for the WIPP facility. Appendix D2 of the WIPP RCRA Part B Permit Application (DOE, 1997a) provided engineering design-basis earthquake and tornado reports. The design-basis earthquake report provides the basis for seismic design of WIPP facility structures, including the WHB foundation. The WIPP design-basis earthquake is 0.1 g. The WIPP design-basis tornado includes a maximum windspeed of 183 mi per hr (mi/hr) (294.5 km/hr), which is the vector sum of all velocity components. It is also limited to a translational velocity of 41 mi/hr (66 km/hr) and a tangential velocity of 124 mi/hr (200 km/hr). Other parameters are a radius of maximum wind of 325 ft (99 m), a pressure drop of 0.5 lb per in.<sup>2</sup> (3.4 kilopascals [kPa]), and a rate-of-pressure drop of 0.09 lb/in.<sup>2</sup>/s (0.6 kPa/s). A design-basis flood report is not available because flooding is not a credible phenomenon at the WIPP facility. Design calculations for the

probable maximum precipitation (**PMP**) event, provided in Appendix D7 of the WIPP RCRA Part B Permit Application (DOE, 1997a), illustrated run-on protection for the WIPP facility.

The following are the major pieces of equipment that will be used to manage CH TRU waste in the container storage units. A summary of equipment capacities, as required by 20.4.1.500 NMAC is included in Table M1-2.

#### TRUPACT-II Type B Packaging

The TRUPACT-II (Figure M1-8a) is a double-contained cylindrical shipping container 8 ft (2.4 m) in diameter and 10 ft (3 m) high. It meets NRC Type B shipping container requirements and has successfully completed rigorous container-integrity tests. The payload consists of approximately 7,265 lbs (3,300 kg) gross weight in up to fourteen 55-gal (208-L) drums, eight 85-gal (322-L) drums, six 100-gal (379-L) drums, two SWBs, or one TDOP.

#### HalfPACT Type B Packaging

The HalfPACT (Figure M1-8b) is a double-contained right cylindrical shipping container 7.8 ft (2.4 m) in diameter and 7.6 ft (2.3 m) high. It meets NRC Type B shipping container requirements and has successfully completed rigorous container-integrity tests. The payload consists of approximately 7,600 lbs (3,500 kg) gross weight in up to seven 55-gal (208-L) drums, one SWB, or four 85-gallon drums.

#### Unloading Docks

Each TRUDOCK is designed to accommodate up to two Contact Handled Packages. The TRUDOCK functions as a work platform, providing TRU mixed waste handling personnel easy access to the container during unloading operations (see Figure M1-9) (Also see Drawing 41-M-001-W in Appendix D3 of the WIPP RCRA Part B Permit Application (DOE, 1997a)).

#### Forklifts

Forklifts will be used to transfer the Contact Handled Packages into the WHB Unit and may be used to transfer palletized CH TRU mixed waste containers to the facility transfer vehicle. Another forklift will be used for general-purpose transfer operations. This forklift has attachments and adapters to handle individual TRU mixed waste containers, if required.

#### Cranes and Adjustable Center-of-Gravity Lift Fixtures

At each TRUDOCK, an overhead bridge crane is used with a specially designed lift fixture for disassembly of the Contact Handled Packages. Separate lifting attachments have been specifically designed to accommodate SWBs and TDOPs. The lift fixture, attached to the crane, has built-in level indicators and two counterweights that can be moved to adjust the center of gravity of unbalanced loads and to keep them level.

## Facility Pallets

The facility pallet is a fabricated steel unit designed to support 7-packs, 4-packs, or 3-packs of drums, SWBs, or TDOPs, and has a rated load of 25,000 lbs. (11,430 kg). The facility pallet will accommodate up to four 7-packs, four 3-packs, or four 4-packs of drums or four SWBs (in two stacks of two units), two TDOPs, or any combination thereof. Loads are secured to the facility pallet during transport to the emplacement area. Facility pallets are shown in Figure M1-10. Fork pockets in the side of the pallet allow the facility pallet to be lifted and transferred by forklift to prevent direct contact between TRU mixed waste containers and forklift tines. This arrangement reduces the potential for puncture accidents. Facility pallets may also be moved by facility transfer vehicles. WIPP facility operational documents define the operational load of the facility pallet to ensure that the rated load of a facility pallet is not exceeded.

## Facility Transfer Vehicle

The facility transfer vehicle is a battery or electric powered automated vehicle that either operates on tracks or has an on-board guidance system that allows the vehicle to operate on the floor of the WHB. An integrated or removable roller bed will be used to move pallets on and off the vehicle. It is designed with a flat bed that has adjustable height capability and will transfer waste payloads on facility pallets to the storage areas be used to transfer the facility pallets on or off the pallet support stands in the waste hoist cage by raising and lowering the bed (see Figure M1-11).

## M1-1c(2) Parking Area Container Storage Unit (Parking Area Unit)

The parking area south of the WHB (see Figure M1-2) will be used for storage of waste containers within sealed shipping containers awaiting unloading. The area extending south from the WHB within the fenced enclosure identified as the Controlled Area on Figure M1-2 is defined as the Parking Area Unit. The Parking Area Unit provides storage space for 12 loaded Contact Handled Packages, corresponding to 1,591 ft<sup>3</sup> (45 m<sup>3</sup>) of CH TRU mixed waste. Secondary containment and protection of the waste containers from standing liquid are provided by the Contact Handled Packaging. Wastes placed in the Parking Area Unit will remain sealed in their Contact Handled Packages, at all times while in this area.

The maximum number of Contact Handled Packages that will be stored in the parking area is twelve, containing a maximum of 1,591 ft<sup>3</sup> (45m<sup>3</sup>) of CH TRU mixed waste. The Nuclear Regulatory Commission (**NRC**) Certificate of Compliance requires that sealed Contact Handled Packages which contain waste be vented every 60 days to avoid unacceptable levels of internal pressure. During normal operations the maximum residence time of any one container in the Parking Area Unit is typically five days. Therefore, during normal waste handling operations, no Contact Handled Packages will require venting while located in the Parking Area Unit. Any off-normal event which results in the need to store a waste container in the Parking Area Unit for a period of time approaching fifty-nine (59) days shall be handled in accordance with Section M1-1e(2) of this Permit Attachment. Under no circumstances shall a Contact Handled Package be stored in the Parking Area Unit for more than fifty-nine (59) days after the date that the inner containment vessel of the Contact Handled Packages was sealed at the generator site.

## M1-1d Container Management Practices

20.4.1.500 NMAC (incorporating 40 CFR §264.173) requires that containers be managed in a manner that does not result in spills or leaks. Containers are required to be closed at all times, unless waste is being placed in the container or removed. Because containers at the WIPP will contain radioactive waste, safety concerns require that containers be continuously vented to obviate the buildup of gases within the container. These gases could result from radiolysis, which is the breakdown of moisture by radiation. The vents, which are nominally 0.75 in. (1.9 centimeters [cm]) in diameter, are generally installed on or near the lids of the containers. These vents are filtered so that gas can escape while particulates are retained.

TRU mixed waste containers, containing off-site waste, are never opened at the WIPP facility. Derived waste containers are kept closed at all times unless waste is being added or removed.

The typical processing rate for CH TRU mixed waste is 14 Contact Handled Packages per day, or seven pallet loads, and the maximum is 28 per day. Two shifts per day are planned, four days per week. The fifth day is for equipment maintenance with weekends available for more extensive maintenance, when necessary.

Off-normal events could interrupt normal operations in the waste management process line. These off normal events fall into the following categories:

- Waste management system equipment malfunctions
- Waste shipments with unacceptable levels of surface contamination
- Hazardous Waste Manifest discrepancies that are not immediately resolved
- A suspension of emplacement activities for regulatory reasons

Shipments of waste from the generator sites will be stopped in any event which results in an interruption to normal waste handling operations that exceeds three days.

Prior to receipt of TRU mixed waste at the WIPP facility, waste operators will be thoroughly trained in the safe use of TRU mixed waste handling and transport equipment. The training will include both classroom training and on-the-job training.

## M1-1d(1) Derived Waste

The WIPP facility operational philosophy is to introduce no new hazardous chemical components into TRU mixed waste or TRU mixed waste residues that could be present in the controlled area. This will be accomplished principally through written procedures and the use of Safe Work Permits (**SWP**)<sup>1</sup> and Radiological Work Permits (**RWP**)<sup>2</sup> which govern the activities

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<sup>1</sup> SWPs are prepared to assure that any hazardous work (not already covered by a procedure) is performed with due precaution. SWPs are issued by the Permittees after a job supervisor completes the proper form detailing the job location, work description, personnel involved, specific hazards involved, and protective requirements. The Permittees review the form, check on the adequacy of the protective measures, and if sufficient, approve the work permit. Conditions of the SWPs must be met while any hazardous work is proceeding. Examples of activities covered by the SWP program include confined space entry, overhead work, and work on



1 within a controlled area involving TRU mixed waste. The purpose of this operating philosophy is  
2 to avoid generating TRU mixed waste that is compositionally different than the TRU mixed  
3 waste shipped to the WIPP facility for disposal.

4 Some additional TRU mixed waste, such as used personal protective equipment, swipes, and  
5 tools, may result from decontamination operations and off-normal events. Such waste will be  
6 assumed to be contaminated with RCRA-regulated hazardous constituents in the TRU mixed  
7 waste containers from which it was derived. Derived waste may be generated as the result of  
8 decontamination activities during the waste handling process. Should decontamination activities  
9 be performed, water and a cleaning agent such as those listed in Permit Attachment F will be  
10 used. Derived waste will be considered acceptable for management at the WIPP facility,  
11 because any TRU mixed waste shipped to the facility will have already been determined to be  
12 acceptable and because no new constituents will be added. Data on the derived waste will be  
13 entered into the WWIS database. Derived waste will be contained in standard DOT approved  
14 Type A containers.

15 The Safety Analysis Report (DOE 1997b) for packaging requires the lids of TRU mixed waste  
16 containers to be vented through high efficiency particulate air (**HEPA**)-grade filters to preclude  
17 container pressurization caused by gas generation and to prevent particulate material from  
18 escaping. Filtered vents used in CH TRU mixed waste containers (55-gal (208-L) drums, 85-gal  
19 (321 L) drums, 100-gal (379-L) drums, TDOPs, and SWBs) have an orifice approximately 0.375-  
20 in. (9.53-millimeters) in diameter through which internally generated gas may pass. The filter  
21 media can be any material (e.g., composite carbon, sintered metal).

22 As each derived waste container is filled, it will be closed with a lid containing a HEPA-grade.  
23 filter and moved to an Underground Hazardous Waste Disposal Unit (**HWDU**) using the same  
24 equipment used for handling TRU mixed waste.

#### 25 M1-1d(2) CH TRU Mixed Waste Handling

26 CH TRU mixed waste containers will arrive by tractor-trailer at the WIPP facility in sealed  
27 shipping containers (e.g., TRUPACT-IIs or HalfPACTs) (see Figure M1-12), at which time they  
28 will undergo security and radiological checks and shipping documentation reviews. A forklift will  
29 remove the Contact Handled Packages and will transport them a short distance through an air  
30 lock that is designed to maintain differential pressure in the WHB. The forklift will place the  
31 shipping containers at one of the two TRUDOCKs in the TRUDOCK Storage Area of the WHB  
32 Unit, where an external survey of the Contact Handled Package inner vessel (see Figure M1-8a  
33 and M1-8b) will be performed as the outer containment vessel lid is lifted. The inner vessel lid  
34 will be lifted under the TRUDOCK Vent Hood System (**VHS**), and the contents will be surveyed

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energized equipment.

<sup>2</sup> RWPs are used to control entry into and performance of work within. Managers responsible for work within a CA must generate a work permit that specifies the work scope, limiting conditions, dosimetry, respiratory protection, protective clothing, specific worker qualifications, and radiation safety technician support. RWPs are approved by the Permittees after thorough review. No work can proceed in a CA without a valid RWP.

during and after this lift. The TRUDOCK VHS<sup>3</sup> is attached to the Contact Handled Package to provide atmospheric control and confinement of headspace gases at their source. It also prevents potential personnel exposure and facility contamination due to the spread of radiologically contaminated airborne dust particles and minimizes personnel exposure to VOCs.

Contamination surveys at the WIPP facility are based in part on radiological surveys used to indicate potential releases of hazardous constituents from containers by virtue of detection of radioactive contamination (see Permit Attachment I3). Radiological surveys may be applicable to most hazardous constituent releases except the release of gaseous VOCs from TRU mixed waste containers. Radiological surveys provide the WIPP facility with a very sensitive method of indicating the potential release of nongaseous hazardous constituents through the use of surface sampling (swipes) and radioactivity counting. Radiological surveys are used in addition to the more conventional techniques such as visual inspection to identify spills.

Under normal operations, it is not expected that the waste containers will be externally contaminated or that removable surface contamination on the shipping package or the waste containers will be in excess of the DOE's free release limits (i.e.; < 20 disintegrations per minute (dpm)<sup>4</sup> per 100 cm<sup>2</sup> alpha or < 200 dpm per 100 cm<sup>2</sup> beta/gamma). In such a case, no further decontamination action is needed. The shipping package and waste container will be handled through the normal process. However, should the magnitude of contamination exceed the free release limits, yet still fall within the criteria for small area "spot" decontamination (i.e., less than or equal to 100 times the free release limit and less than or equal to 6 ft<sup>2</sup> [0.56 m<sup>2</sup>]), the shipping package or the waste container will be decontaminated. Decontamination activities will not be conducted on containers which are not in good condition, or containers which are leaking. Containers which are not in good condition, and containers which are leaking, will be overpacked, repaired/patched in accordance with 49 CFR §173 and §178 (e.g., 49 CFR §173.28), or returned to the generator. In addition, if during the waste handling process at the WIPP a waste container is breached, it will be overpacked, repaired/patched in accordance with 49 CFR §173 and §178 (e.g., 49 CFR §173.28), or returned to the generator. Should WIPP structures or equipment become contaminated, waste handling operations in the affected area will be immediately suspended.

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<sup>3</sup> The TRU mixed waste container headspace may contain radiologically contaminated airborne dust particles.

1. Without the TRUDOCK VHS, a potential mechanism will exist to spread contamination (if present) in the immediate CH TRU mixed waste handling area, because lid removal will immediately expose headspace gases to prevailing air currents induced by the building ventilation system.
2. With the VHS, a confined and controlled set of prevailing air currents will be induced by the system blower. The TRUDOCK VHS will function as a local exhaust system to effectively control radiologically contaminated airborne dust particles (and VOCs) at essentially atmospheric pressure conditions.

Functionally, the TRUDOCK VHS will draw the TRU mixed waste container headspace gases, convey them through a HEPA filter, and ultimately duct them through the WHB exhaust ventilation system. VOCs will pass through the HEPA filter and will be conveyed to the ventilation exhaust duct system. The system principally consists of a functional aggregation of 1) vent hood assembly, 2) HEPA filter assemblies (to capture any airborne radioactive particles), 3) blower (to provide forced airflow), 4) ductwork, and 5) flexible hose.

<sup>4</sup> The unit "dpm" stands for "disintegration per minute" and is the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

Decontamination activities will use water and cleaning agents (see Permit Attachment F) so as to not generate any waste that cannot be considered derived waste. Items that are radiologically contaminated are also assumed to be contaminated with the hazardous wastes that are in the container involved in the spill or release. A complete listing of these waste components can be obtained from the WIPP Waste Identification System (**WWIS**), as described in Permit Attachment B, for the purpose of characterizing derived waste.

It is assumed that the process of decontamination will remove the hazardous waste constituents along with the radioactive waste constituents. To provide verification of the effectiveness of the removal of hazardous waste constituents, once a contaminated surface is demonstrated to be radiologically clean, the "swipe" will be sent for analysis for hazardous constituents. The use of these confirmation analyses is as follows:

**For waste containers**, the analyses becomes documentation of the condition of the container at the time of emplacement. The presence of hazardous waste constituents on a container after decontamination will be at trace levels and will likely not be visible and will not pose a threat to human health or the environment. These containers will be placed in the underground without further action once the radiological contamination is removed unless there is visible evidence of hazardous waste spills or hazardous waste on the container and this contamination is considered likely to be released prior to emplacement in the underground.

**For area contamination**, once the area is cleaned up and is shown to be radiologically clean, it will be sampled for the presence of hazardous waste residues. If the area is large, a sampling plan will be developed which incorporates the guidance of EPA's SW 846 in selecting random samples over large areas. Selection of constituents for sampling analysis will be based on information (in the WWIS) about the waste that was spilled and information on cleanup procedures. If the area is small, swipes will be used. If the results of the analysis show that residual contamination remains, a decision will be made whether further cleaning will be beneficial or whether final clean up shall be deferred until closure. For example, if hazardous constituents react with the floor coating and are essentially nonremovable without removing the coating, then clean up will be deferred until closure when the coatings will be stripped. In any case, appropriate notations will be entered into the operating record to assure proper consideration of formerly contaminated areas at the time of closure. Furthermore, measures such as covering, barricading, and/or placarding will be used as needed to mark areas that remain contaminated.

Small area decontamination, if needed, will occur in the area in which it is detected for contamination that is less than 6 ft<sup>2</sup> (0.56 m<sup>2</sup>) in area and is less than 100 times the free release limit. The free release limit is defined by DOE Orders as alpha contamination less than 20 dpm/100 cm<sup>2</sup> and beta-gamma contamination less than 200 dpm/100 cm<sup>2</sup>. Overpacking would occur in the event the WIPP staff damages an otherwise intact container during handling activities. In such a case, a radiological boundary will be established, inside which all activities are carefully controlled in accordance with the protocols for the cleanup of spills or releases. A plan of recovery will be developed and executed, including overpacking the damaged container in either a 85-gal (321 L) drum, SWB, or a TDOP. The overpacked container will be properly labeled and sent underground for disposal. The area will then be decontaminated and verified to be free of contamination using both radiological and hazardous waste sampling techniques (essentially, this is done with "swipes" of the surface for counting in sensitive radiation detection

equipment or, if no radioactivity is present, by analysis for hazardous waste by an offsite laboratory).

In the event a large area contamination is discovered within a Contact Handled Package during unloading, the waste will be left in the Contact Handled Package and the shipping container will be resealed. The DOE considers such contamination problems the responsibility of the shipping site. Therefore, the shipper will have several options for disposition. These are as follows:

- The Contact Handled Package can be returned to the shipper for decontamination and repackaging of the waste. Such waste would have to be re-approved prior to shipment to the WIPP.
- Shipment to another DOE site for management in the event the original shipper does not have suitable facilities for decontamination. If the receiving site wishes to return the waste to WIPP, the site will have to meet the characterization requirements of the WAP.
- The waste could go to a third (non-DOE) party for decontamination. In such cases, the repaired shipment would go to the original shipper and be recertified prior to shipment to the WIPP.

Written procedures specify materials, protocols, and steps needed to put an object into a safe configuration for decontamination of surfaces. A RWP will always be prepared prior to decontamination activities. TRU mixed waste products from decontamination will be managed as derived waste.<sup>5</sup>

The TRUPACT-II may hold up to two 7-packs, two 4-packs, two 3-packs, two SWBs, or one TDOP. A HalfPACT may hold seven 55-gal (208-L) drums, one SWB, or four 85-gallon drums. An overhead bridge crane will be used to remove the contents of the Contact Handled Package and place them on a facility pallet. The containers will be visually inspected for physical damage (severe rusting, apparent structural defects, signs of pressurization, etc.) and leakage to ensure they are in good condition prior to storage. Waste containers will also be checked for external surface contamination. If a primary waste container is not in good condition, the Permittees will overpack the container, repair/patch the container in accordance with 49 CFR §173 and §178 (e.g., 49 CFR §173.28), or return the container to the generator.

For inventory control purposes, TRU mixed waste container identification numbers will be verified against the Uniform Hazardous Waste Manifest and the WWIS. Inconsistencies will be resolved with the generator before TRU mixed waste is emplaced. Discrepancies that are not resolved within 15 days will be reported to the NMED in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264.72).

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<sup>5</sup> Note that the DOE had previously proposed use of an Overpack and Repair Room to deal with major decontamination and overpacking activities. The DOE has eliminated the need for this area by: 1) limiting the size of contamination events that will be dealt with as described in this section, and 2) by performing overpacking at the point where a need for overpacking is identified instead of moving the waste to another area of the WHB. This strategy minimizes the spread of contamination.

Each facility pallet has two recessed pockets to accommodate two sets of 7-packs, two sets of 4-packs, two sets of 3-packs, or two SWBs stacked two-high, two TDOPs, or any combination thereof. Each stack of waste containers will be secured prior to transport underground (see Figure M1-10). A forklift or the facility transfer vehicle will transport the loaded facility pallet to the conveyance loading room located adjacent to the Waste Shaft. The conveyance loading room serves as an air lock between the CH Bay and the Waste Hoist Shaft, preventing excessive air flow between the two areas. The facility transfer vehicle will be driven onto the waste hoist deck, where the loaded facility pallet will be transferred to the waste hoist, and the facility transfer vehicle will be backed off. Containers of CH TRU waste (55-gal (208 L) drums, SWBs, 85-gal (321 L) drums, 100-gal (379-L) drums, and TDOPs) can be handled individually, if needed, using the forklift and lifting attachments (i.e., drum handlers, parrot beaks).

The waste hoist will lower the loaded facility pallet to the Underground HWDUs. Figure M1-13 is a flow diagram of the CH TRU mixed waste handling process.

#### M1-1e Inspections

Inspection of containers and container storage area are required by 20.4.1.500 NMAC (incorporating 40 CFR §264.174). These inspections are described in this section.

##### M1-1e(1) WHB Unit

The waste containers in storage will be visually inspected prior to each movement and, at a minimum, weekly, to ensure that the waste containers are in good condition and that there are no signs that a release has occurred. Waste containers will be visually inspected for physical damage (severe rusting, apparent structural defects, signs of pressurization, etc.) and leakage. If a primary waste container is not in good condition, the Permittees will overpack the container, repair/patch the container in accordance with 49 CFR §173 and §178 (e.g., 49 CFR §173.28), or return the container to the generator. This visual inspection shall not include the center drums of 7-packs and waste containers positioned such that visual observation is precluded due to the arrangement of waste assemblies on the facility pallets. If waste handling operations should stop for any reason with containers located in the TRUDOCK Storage Area in the Contact Handled Package, primary waste container inspections will not be accomplished until the containers of waste are removed from the Contact Handled Package. If the lid to the Contact Handled Package inner container vessel is removed, radiological checks (swipes of Contact Handled Package inner surfaces) will be used to determine if there is contamination within the Contact Handled Package. Such contamination could indicate a waste container leak or spill. Using radiological surveys, a detected spill or leak of a radioactive contamination from a waste container will also be assumed to be a hazardous waste spill or release.

Inspections of the Shielded Storage Area designated for holding waste while manifest discrepancies are resolved, are performed prior to use and weekly thereafter, so long as waste containers reside in the Shielded Storage Area. Waste containers residing within a Contact Handled Package are not inspected, as described in the first bullet in Section M1-1e(2).

Waste containers will be inspected prior to reentering the waste management process line for downloading to the underground. Waste containers stored in this area will be inspected at least once weekly.

1     M1-1e(2) Parking Area Unit

2     Inspections will be conducted in the Parking Area Unit at a frequency not less than once weekly.  
3     These inspections are applicable to loaded, stored Contact Handled Packages. The perimeter  
4     fence located at the lateral limit of the Parking Area Unit, coupled with personnel access  
5     restrictions into the WHB, will provide the needed security. The perimeter fence and the  
6     southern border of the WHB shall mark the lateral limit of the Parking Area Unit (Figure M1-2).  
7     Inspections of the Contact Handled Packages stored in the Parking Area Unit will focus on the  
8     inventory and integrity of the shipping containers and the spacing between Contact Handled  
9     Packages. This spacing will be maintained at a minimum of four feet.

10    Contact Handled Packages located in the Parking Area Unit will be inspected weekly during  
11    use and prior to each reuse.

12    Inspection of waste containers is not possible when the containers are in their shipping  
13    container (e.g., TRUPACT-II or HalfPACTs). Inspections can be accomplished by bringing the  
14    shipping containers into the WHB Unit and opening them and lifting the waste containers out for  
15    inspection. The DOE, however, believes that removing containers strictly for the purposes of  
16    inspection results in unnecessary worker exposures and subjects the waste to additional  
17    handling. The DOE has proposed that waste containers need not be inspected at all until they  
18    are ready to be removed from the shipping container for emplacement underground. Because  
19    shipping containers are sealed and are of robust design, no harm can come to the waste while  
20    in the shipping containers and the waste cannot leak or otherwise be released to the  
21    environment. Contact Handled Packages shall be opened every 60 days for the purposes of  
22    venting, so that the longest waste would be uninspected would be for 60 days from the date that  
23    the inner containment vessel of the Contact Handled Package was closed at the generator site.  
24    Venting the Contact Handled Packages involves removing the outer lid and installing a tool in  
25    the port of the inner lid.

26    The following strategy will be used for inspecting waste containers that will be retained within  
27    their shipping containers for an extended period of time:

- 28       •     If the reason for retaining the TRU mixed waste containers in the shipping  
29       container is due to an unresolved manifest discrepancy, the DOE will return the  
30       shipment to the generator prior to the expiration of the 60 day NRC venting  
31       period or within 30 days after receipt at the WIPP, whichever comes sooner. In  
32       this case, no inspections of the internal containers will be performed. The stored  
33       Contact Handled Package will be inspected weekly as described above.
- 34       •     If the reason for retaining the TRU mixed waste containers in the Contact  
35       Handled Package is due to an equipment malfunction that prevents unloading  
36       the waste in the WHB Unit, the DOE will return the shipment to the generator  
37       prior to the expiration of the 60 day NRC venting period. In this case, the DOE  
38       would have to ship the TRU mixed waste containers back with sufficient time for  
39       the generator to vent the shipment within the 60 day limit. In this case, no  
40       inspections of the internal containers will be performed. The stored Contact  
41       Handled Package will be inspected weekly as described above.

- If the reason for retaining the TRU mixed waste containers is due to an equipment malfunction that prevents the timely movement of the waste containers into the underground, the waste containers will be kept in the Contact Handled Package until day 30 (after receipt at the WIPP) or the expiration of the 60 day limit, whichever comes sooner. At that time the Contact Handled Package will be moved into the WHB and the TRU mixed waste containers removed and placed in one of the permitted storage areas in the WHB Unit. If there is no additional space within the permitted storage areas of the WHB Unit, the DOE will discuss an emergency permit with the NMED for the purposes of storing the waste elsewhere in the WHB Unit. Waste containers will be inspected when removed from the Contact Handled Packaging and weekly while in storage in the WHB Unit. Contact Handled Packages will be inspected weekly while they contain TRU mixed waste containers as discussed above.

The DOE believes that this strategy minimizes both the amount of shipping that is necessary and the amount of waste handling, while maintaining a reasonable inspection schedule. The DOE will stop shipments of waste for any equipment outage that will extend beyond three days.

#### M1-1f Containment

The WHB Unit has concrete floors, which are sealed with a coating that is designed to resist all but the strongest oxidizing agents. Such oxidizing agents do not meet the TSDF-WAC and will not be accepted in TRU mixed waste at the WIPP facility. Therefore, TRU mixed wastes pose no compatibility problems with respect to the WHB Unit floor. The floor coating consists of Carboline® 1340 clear primer-sealer on top of prepared concrete, Carboline® 191 primer epoxy, and Carboline® 195 surface epoxy. The manufacturer's chemical resistance guide shows "Very Good" for acids and "Excellent" for alkalis, solvents, salt, and water. Uses are indicated for nuclear power plants, industrial equipment and components, chemical processing plants, and pulp and paper mills for protection of structural steel and concrete. During the Disposal Phase, should the floors need to be re-coated, any floor coating used in the WHB Unit TRU mixed waste handling areas will be compatible with the TRU mixed waste constituents and will have chemical resistance at least equivalent to the Carboline® products. Figure M1-14 is a plan view of the WHB, showing areas where CH TRU mixed waste handling activities discussed in this section occur.

During normal operations, the floor of the storage areas within the WHB Unit shall be visually inspected on a weekly basis to verify that it is in good condition and free of cracks and gaps. Floor areas of the WHB Unit in use during off-normal events will be inspected prior to use and weekly thereafter. All TRU mixed waste containers located in the permitted storage areas shall be elevated at least 6 in. (15 cm) from the surface of the floor. TRU mixed waste containers that have been removed from Contact Handled Packaging shall be stored at a designated storage area inside the WHB Unit so as to preclude exposure to the elements.

Secondary containment at the NE Storage Area and the Shielded Storage Area inside the WHB Unit shall be provided by the WHB Unit floor (See Figure M1-1). The WHB Unit is engineered such that during normal operations, the floor capacity is sufficient to contain liquids upon release. Secondary Containment at the Derived Waste Storage Area of the WHB Unit will be provided by a polyethylene standard drum pallet. The Parking Area Unit and TRUDOCK

Storage Area of the WHB Unit require no engineered secondary containment since no waste is to be stored there unless it is protected by the Contact Handled Packaging.

Calculations to determine the floor surface area required to provide secondary containment in the event of a release are based on the maximum quantity of liquid which could be present within ten percent of one percent of the volume of all the containers or one percent of the capacity of the largest single container, whichever is greater.

#### M1-1f(1) Secondary Containment Requirements for the WHB Unit

The maximum volume of TRU mixed waste that will be stored in the NE Storage Area of the WHB Unit is seven facility pallets @ 4 SWBs per pallet = 28 SWBs of waste. 28 SWBs @ 496 gal (1,878 L) per SWB = 13,888 gal (52,570 L) waste container capacity. 13,888 gal (52,570 L) x ten percent of the total volume = 1,389 gal (5,258 L) of waste. Since 1,389 gal (5,263 L) is greater than 496 gal (1,878 L), the volume of the largest single container, the configuration of all SWBs in the storage area is used for the calculation of secondary containment requirements. 1,389 gal (5,258 L) of liquid x one percent liquids = 13.9 gal (52.6 L) of liquid for which secondary containment is needed.

The maximum volume of TRU mixed waste that will be stored in the Shielded Storage Area of the WHB Unit is one facility pallet @ 4 SWBs per pallet = 4 SWBs of waste. 4 SWBs @ 496 gal (1,878 L) per SWB = 1,984 gal (7,510 L) waste container capacity. 1,984 gal (7,510 L) x ten percent of the total volume = 198.4 gal (751 L) of waste. Since 198.4 gal (751 L) is less than 496 gal (1,878 L), the volume of the largest single container, the volume of the largest container (an SWB) in the storage area is used for the calculation of secondary containment requirements. 496 gal (1,878 L) of liquid x one percent liquids = 4.96 gal (18.8 L) of liquid for which secondary containment is needed.

The maximum volume of TRU mixed waste that will be stored in the Derived Waste Storage Area of the WHB Unit is one SWB. 1 SWBs @ 496 gal (1,878 L) per SWB = 496 gal (1,878 L) waste container capacity. Since the maximum storage volume of 496 gal (1,878 L) is equal to the volume of the largest single container, the volume of the a single SWB is used for the calculation of secondary containment requirements. 496 gal (1,878 L) of liquid x one percent liquids = 4.96 gal (18.8 L) of liquid for which secondary containment is needed.

#### M1-1f(2) Secondary Containment Description

The following is a calculation of the surface area the quantities of liquid would cover. Using a conversion factor of 0.1337 ft<sup>3</sup>/gal (0.001 m<sup>3</sup>/L) and assuming the spill is 0.0033 ft (0.001 m) thick, the following calculation can be used:

$$\text{gallons} \times \text{cubic feet per gallon} \div \text{thickness in feet} = \text{area covered in square feet}$$

NE Storage Area

$$13.9 \text{ gal} \times 0.1337 \text{ ft}^3/\text{gal} \div 0.0033 \text{ ft} = 563 \text{ ft}^2 (52.3 \text{ m}^2)$$



## Shielded Storage Area

$$4.96 \text{ gal} \times 0.1337 \text{ ft}^3/\text{gal} \div 0.0033 \text{ ft} = 201 \text{ ft}^2 (18.67 \text{ m}^2)$$

The WHB Unit has 33,175 ft<sup>2</sup> (3,082 m<sup>2</sup>) of floor space, the NE Storage Area in the northeast corner of the WHB Unit (Figure M1-7) has 2,924 ft<sup>2</sup> (272 m<sup>2</sup>) of floor space, and the Shielded Storage Area has 292.5 ft<sup>2</sup> (27.2 m<sup>2</sup>) of floor space. Thus, the floor area of the NE Storage Area and the Shielded Storage Area of the WHB Unit provide sufficient secondary containment to contain a release of ten percent of one percent of the volume of all of the containers, or one percent of the capacity of the largest container, whichever is greater.

## Derived Waste Storage Area

The derived waste containers in the Derived Waste Storage Area will be stored on standard drum pallets, which provides approximately 50 gal (190 L) of secondary containment capacity. Thus the secondary containment capacity of the standard drum pallet is sufficient to contain a release of ten percent of one percent of the largest container (4.96 gal or 18.8 L).

## Parking Area Unit

Containers of TRU mixed waste to be stored in the Parking Area Unit will be in Contact Handled Packages. There will be no additional requirements for engineered secondary containment systems.

### M1-1g Special Requirements for Ignitable, Reactive, and Incompatible Waste

Special requirements for ignitable, reactive, and incompatible waste are addressed in 20.4.1.500 NMAC (incorporating 40 CFR §§264.176 and 264.177). Permit Module II precludes ignitable, reactive, or incompatible waste at the WIPP. No additional measures are required.

### M1-1h Closure

Clean closure is planned in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264.178) for all permitted container storage areas. The applicable areas and the plans for clean closure are detailed in Permit Attachment I.

### M1-1i Control of Run On

The WHB Unit is located indoors which prevents run-on from a precipitation event. In addition, the containers are stored on facility pallets or standard drum pallets, which elevate the CH TRU mixed waste containers at least 6 in. (15 cm) off the floor, or in Contact Handled Packages, so that any firewater released in the building will not pool around containers. In the Parking Lot Unit, the containers of TRU mixed waste are always in Contact Handled Packages which protect them from precipitation and run on. Therefore, the WIPP container storage units will comply with the requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.175(b)(4)).

## References

- DOE, 1997a. Resource Conservation and Recovery Act Part B Permit Application, Waste Isolation Pilot Plant (WIPP), Carlsbad, New Mexico, Rev. 6.5, 1997.
- DOE, 1997b. Waste Isolation Pilot Plant Safety Analysis Report (DOE/WIPP-95-2065, Rev. 1), U.S. Department of Energy, Carlsbad Area Office, Carlsbad, NM, April 1997.

## **TABLES**

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**TABLE M1-1**  
**BASIC DESIGN REQUIREMENTS, PRINCIPAL**  
**CODES, AND STANDARDS**

	STRUCTURE/SUPPORTS			LIQUID AND PROCESS AIR HANDLING PROCESSING AND STORAGE EQUIPMENT							AIR HDLG DUCTING & FANS	HVAC FILTERS		MECHANICAL HANDLING EQUIPMENT			INSTRUMENTATION AND ELECTRICAL			QUALITY ASSURANCE PROGRAM	
	DBE DBT ACI-318 AISC	ANSI A58.1	SITE-SPECIFIC REQUIREMENTS	VESSEL ASME VIII NFPA <sup>a</sup>	ANSI BBB,1 NFPA <sup>a</sup>	UP	PUMPS API-610 NFPA <sup>a</sup>	STORAGE TANKS API-650 OR API-620	HEAT EXCHGRS ASME VIII TEMA	ALL OTHER EQUIPMENT MFRs STD	ARI SMACNA AMCA	PRE-FILTERS ASHRAE 52.68	HEPA FILTERS MIL F 51068C ANSI N 509 ANSI N 510	CRANE AND RELATED EQUIPMENT CMAA	CMAA AISC AWS	ALL OTHER EQUIP-MEANT MFRs STD	A-NE	ANSI SODS OR NAT'L ELECT-TRIAL CODE	IA/ MFRs STD	ANSI/ASME NQA-1 AND SUPPLE-MENTS	COM. AND INDUSTRY PRACTICES
DESIGN CLASS I	X		a	X f			X	X	X		X c	X c,d	X c	X	X		X	X		X	
DESIGN CLASS II	a,b	X	a	X	X		X	X	X		X c	X c	X c	X	X			X	X	X	
DESIGN CLASS IIIA	a	X	a	a	X		a			X	X c	X c	X c	a	a	X		X	X	X	
DESIGN CLASS III		X	g		a	X				X	X	X	X			X		X	X		X

X = Minimum Requirements

<sup>a</sup> Requirements to be determined on a case-by-case basis.

<sup>b</sup> Required for structure and supports needed for confinement and control of radioactivity.

<sup>c</sup> Except structures and supports that are designed to withstand a design-basis earthquake (DBE)/design-basis tornado (DBT) when specified in column 1 of this table.

<sup>d</sup> Underwriter's Laboratory (UL) Class I Listed.

<sup>e</sup> For fire-protection systems.

<sup>f</sup> American Society for Mechanical Engineers (ASME) III for other Class I vessels.

<sup>g</sup> Design of underground structures, mining equipment, and facilities are basically governed by the MSHA and experience in local mines.

ACI	=	American Concrete Institute	AWS	=	American Welding Society	SMACNA	=	Sheet Metal and Air Conditioning Contractors National Association, Inc.
AISC	=	American Institute of Steel Construction	CMAA	=	Crane Manufacturers Association	STD	=	Standard
AMCA	=	Air Moving and Conditioning Association	DBE	=	Design-basis earthquake	TEMA	=	Tubular Exchanger Manufacturers Association
ANSI	=	American National Standards Institute	DBT	=	Design-basis tornado	UP	=	Uniform Plumbing Code
API	=	American Petroleum Institute	HEPA	=	High-efficiency particulate air			
ARI	=	Air Conditioning and Refrigeration Institute	HVAC	=	Heating, Ventilation, and Air-Conditioning			
ASHRAE	=	American Society of Heating, Refrigeration, and Air Conditioning Engineers, Inc.	A	=	Institute of Electronics and Electronic Engineers			
			IA	=	Instrument Society of America			
			MFR	=	Manufacturer			
			MIL	=	Military (specification)			
			MSHA	=	Mine Safety and Health Administration			
			NFPA	=	National Fire Protection Association			
			NQA	=	Nuclear Quality Assurance (Standard)			

**TABLE M1-2  
WASTE HANDLING EQUIPMENT CAPACITIES**

<b>CAPACITIES FOR EQUIPMENT</b>	
CH Bay overhead bridge crane	12,000 lbs.
CH Bay forklifts	26,000 lbs.
Facility Pallet	25,000 lbs.
Adjustable center-of-gravity lift fixture	10,000 lbs.
Facility Transfer Vehicle	26,000 lbs.
<b>MAXIMUM GROSS WEIGHTS OF CONTAINERS</b>	
Seven-pack of 55-gallon drums	7,000 lbs.
Four-pack of 85-gallon drums	4,500 lbs.
Three-pack of 100-gallon drums	3,000 lbs.
Ten-drum overpack	6,700 lbs.
Standard waste box	4,000 lbs.
<b>MAXIMUM NET EMPTY WEIGHTS OF EQUIPMENT</b>	
TRUPACT-II	13,140 lbs.
HalfPACT	10,500 lbs.
Adjustable center of gravity lift fixture	2,500 lbs.
Facility pallet	4,120 lbs.

## FIGURES

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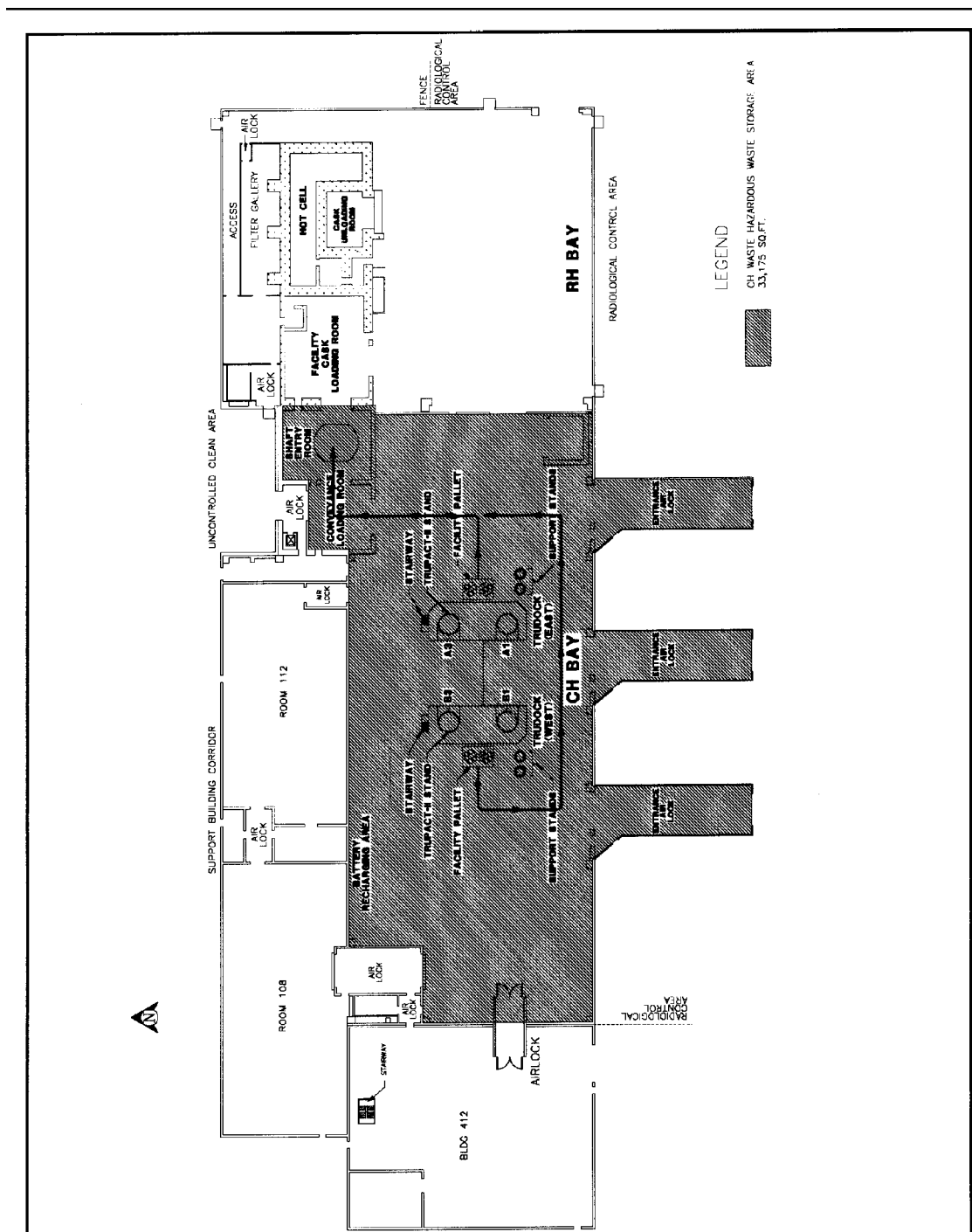


Figure M1-1  
Waste Handling Building - Container Storage Unit

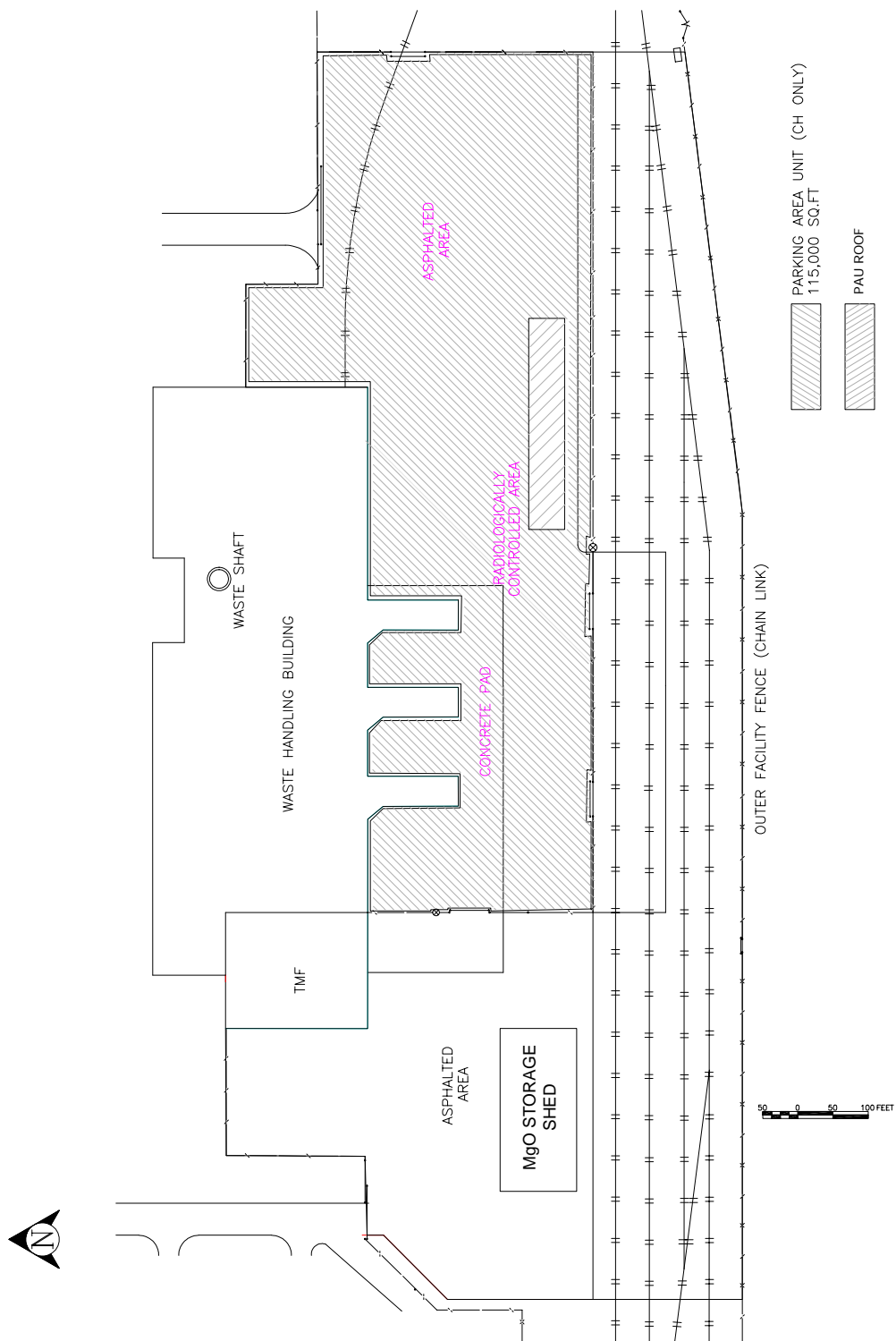


Figure M1-2  
Parking Area - Container Storage Unit

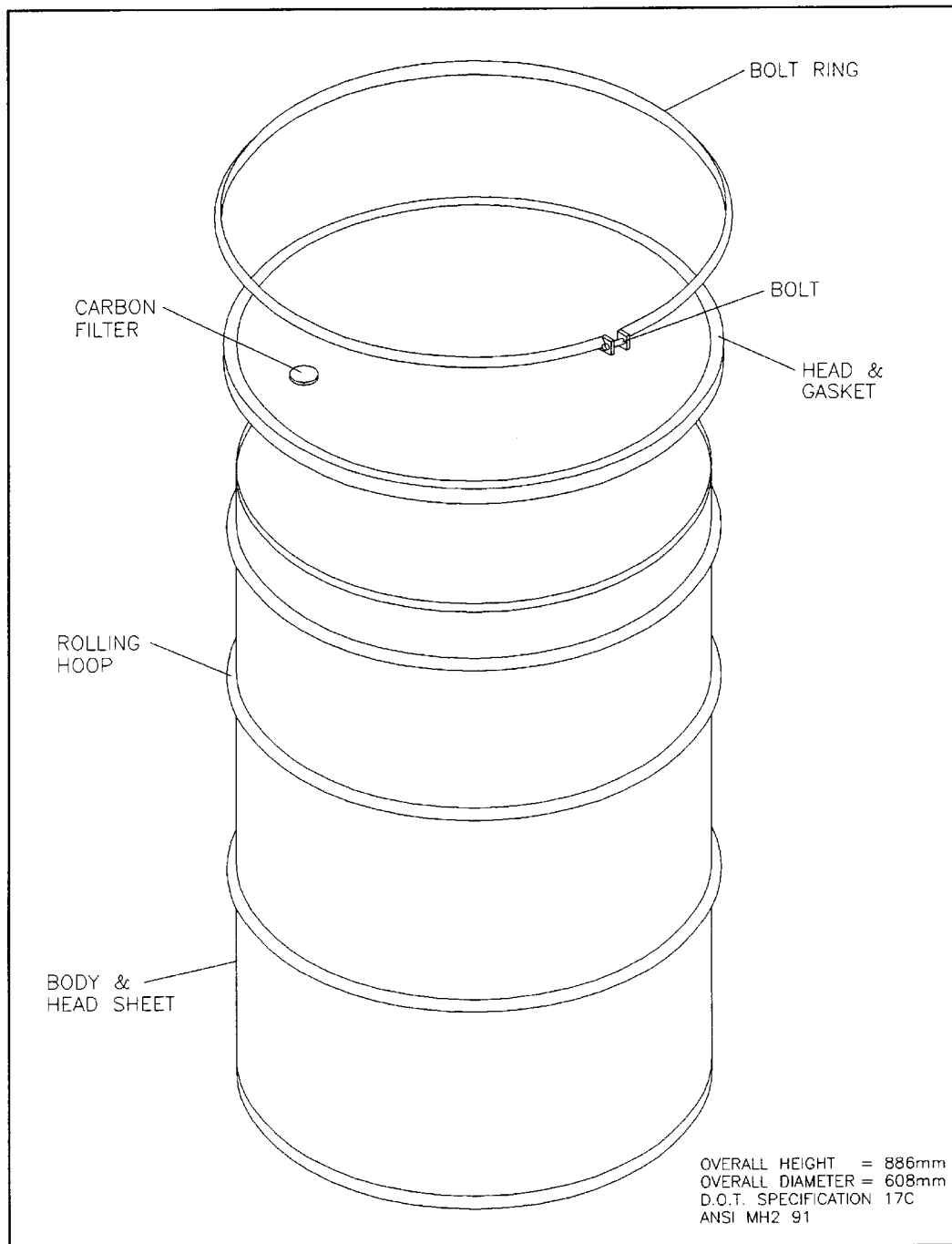


Figure M1-3  
Standard 55-Gallon Drum (Typical)

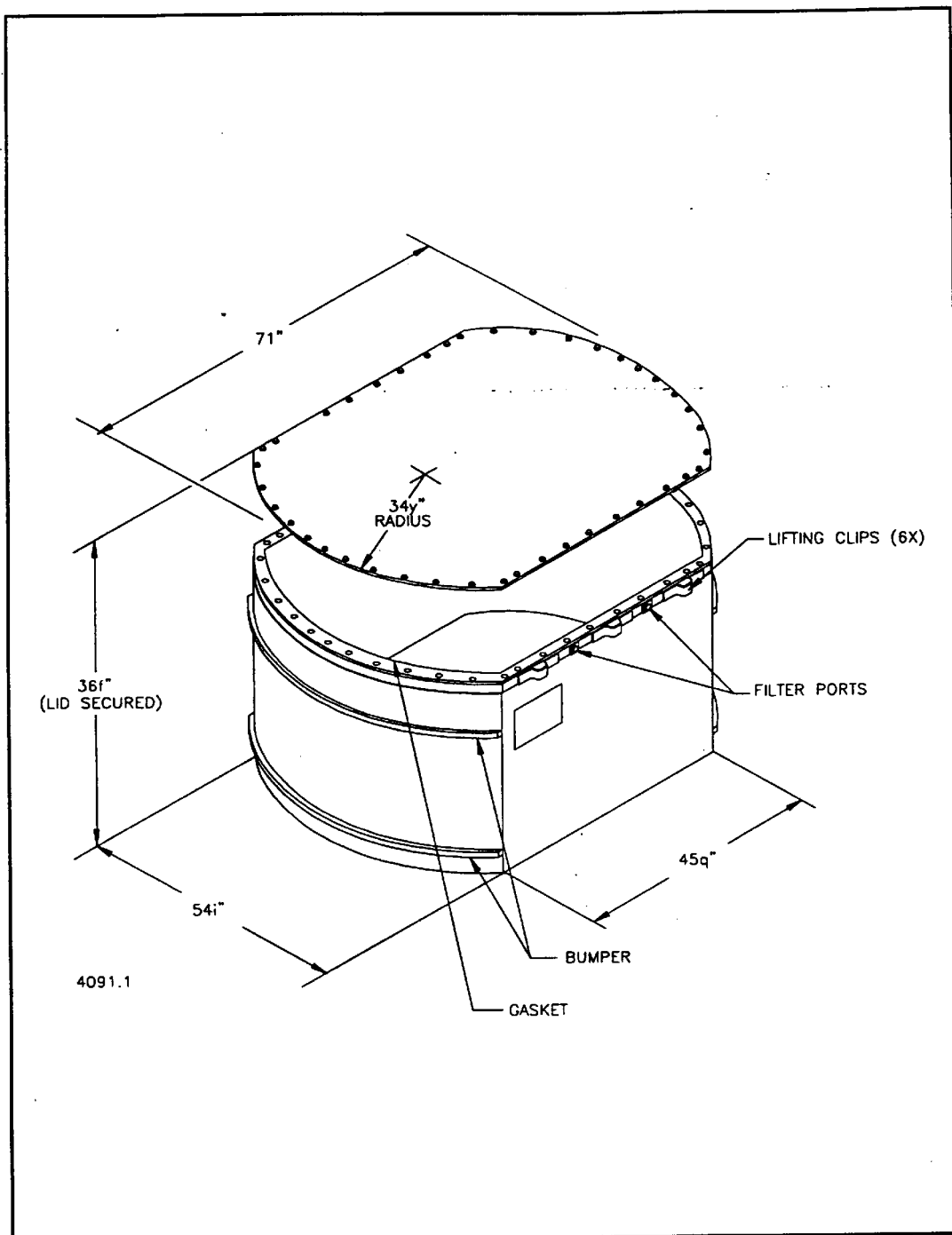


Figure M1-4  
Standard Waste Box

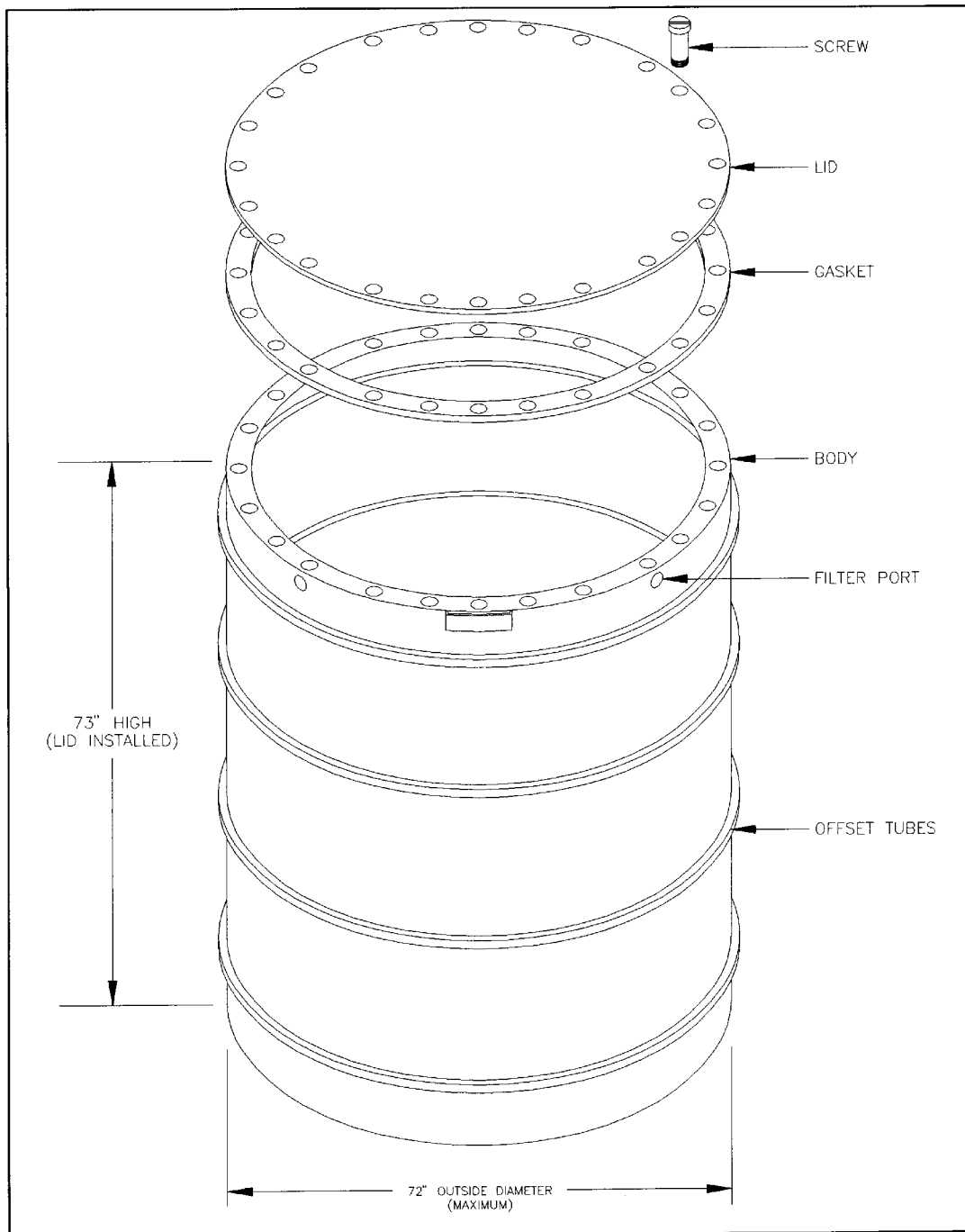


Figure M1-5  
Ten-Drum Overpack

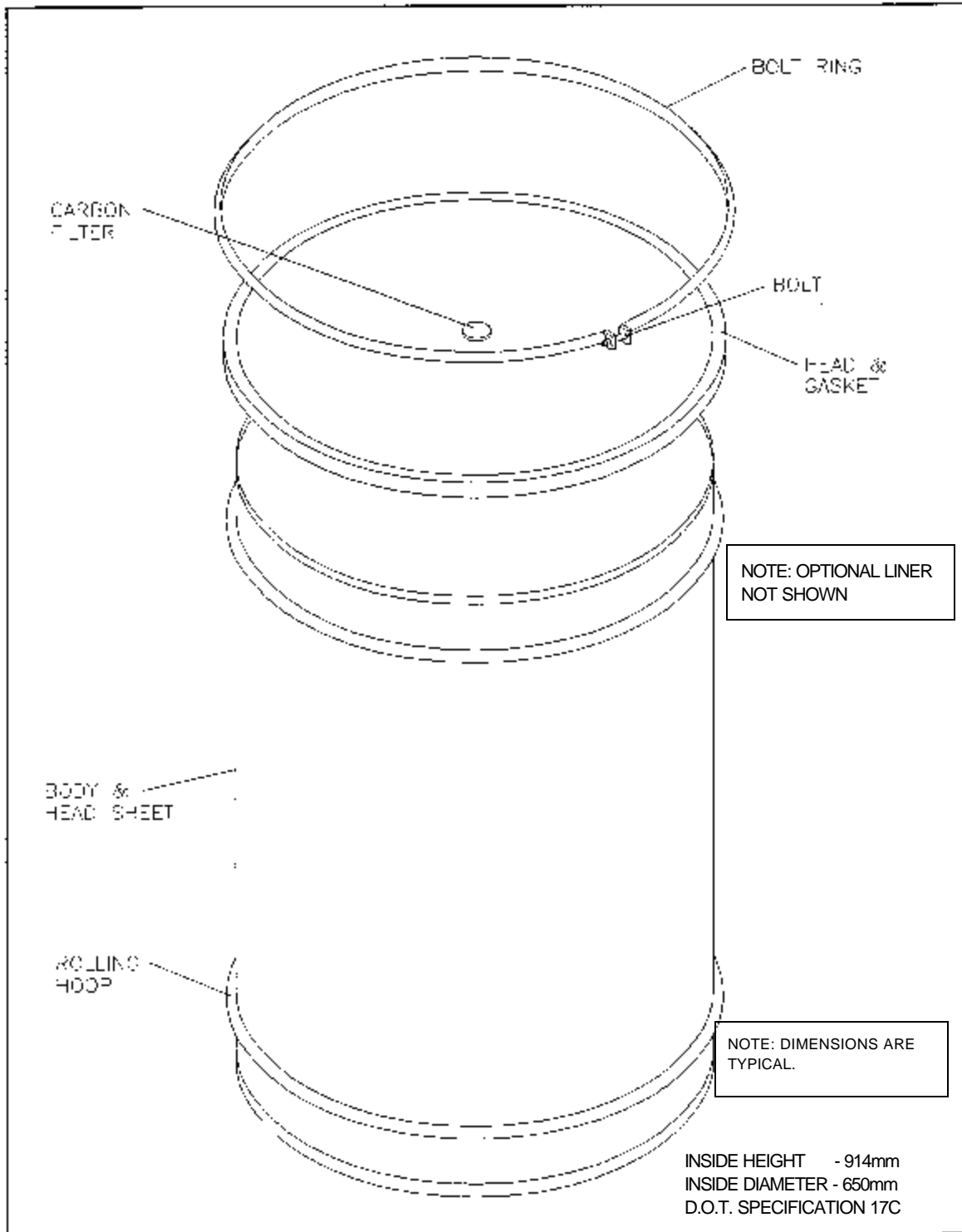


Figure M1-6  
85-Gallon Drum

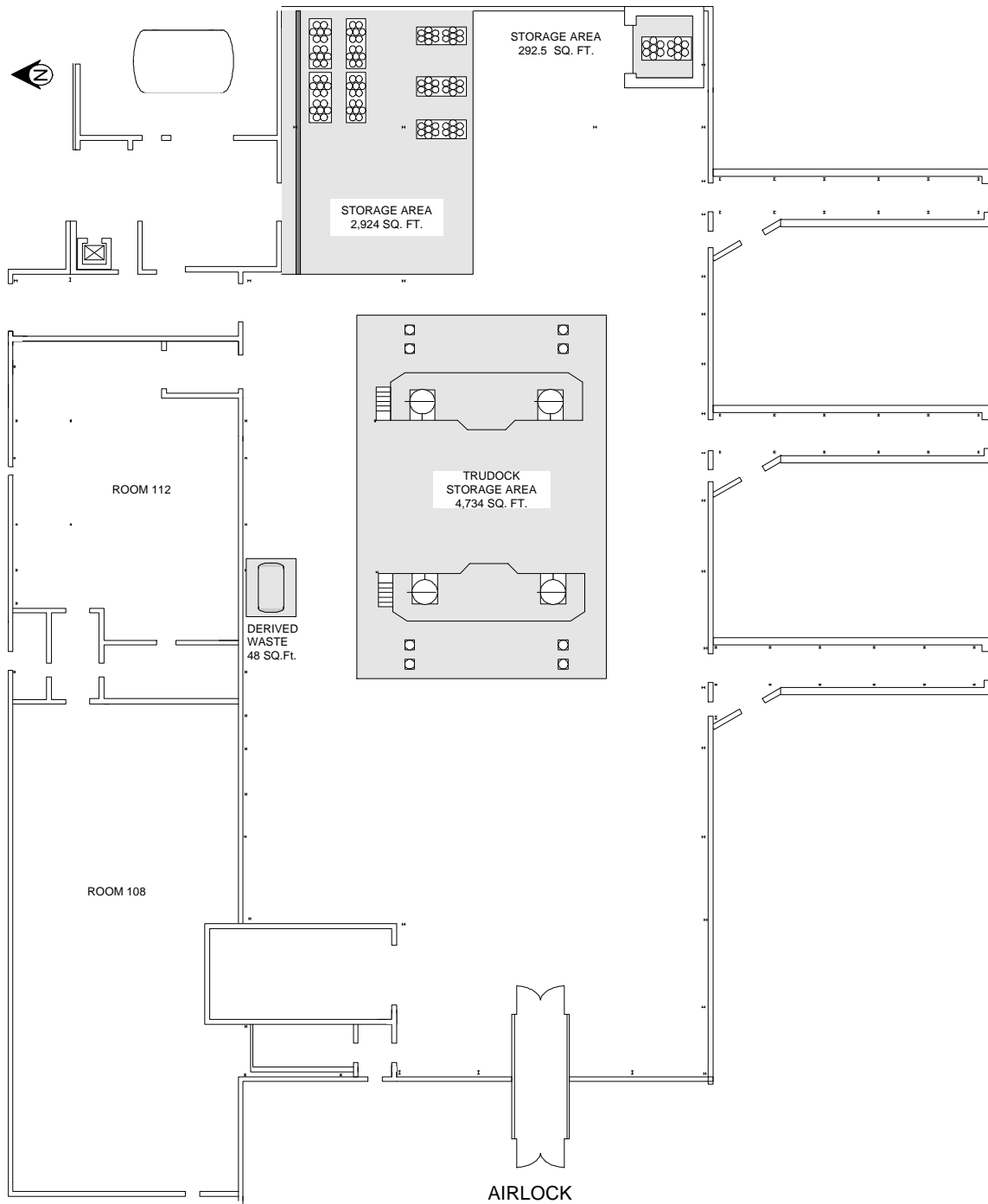


Figure M1-7  
Waste Handling Building - Facility Pallet Temporary Storage Area

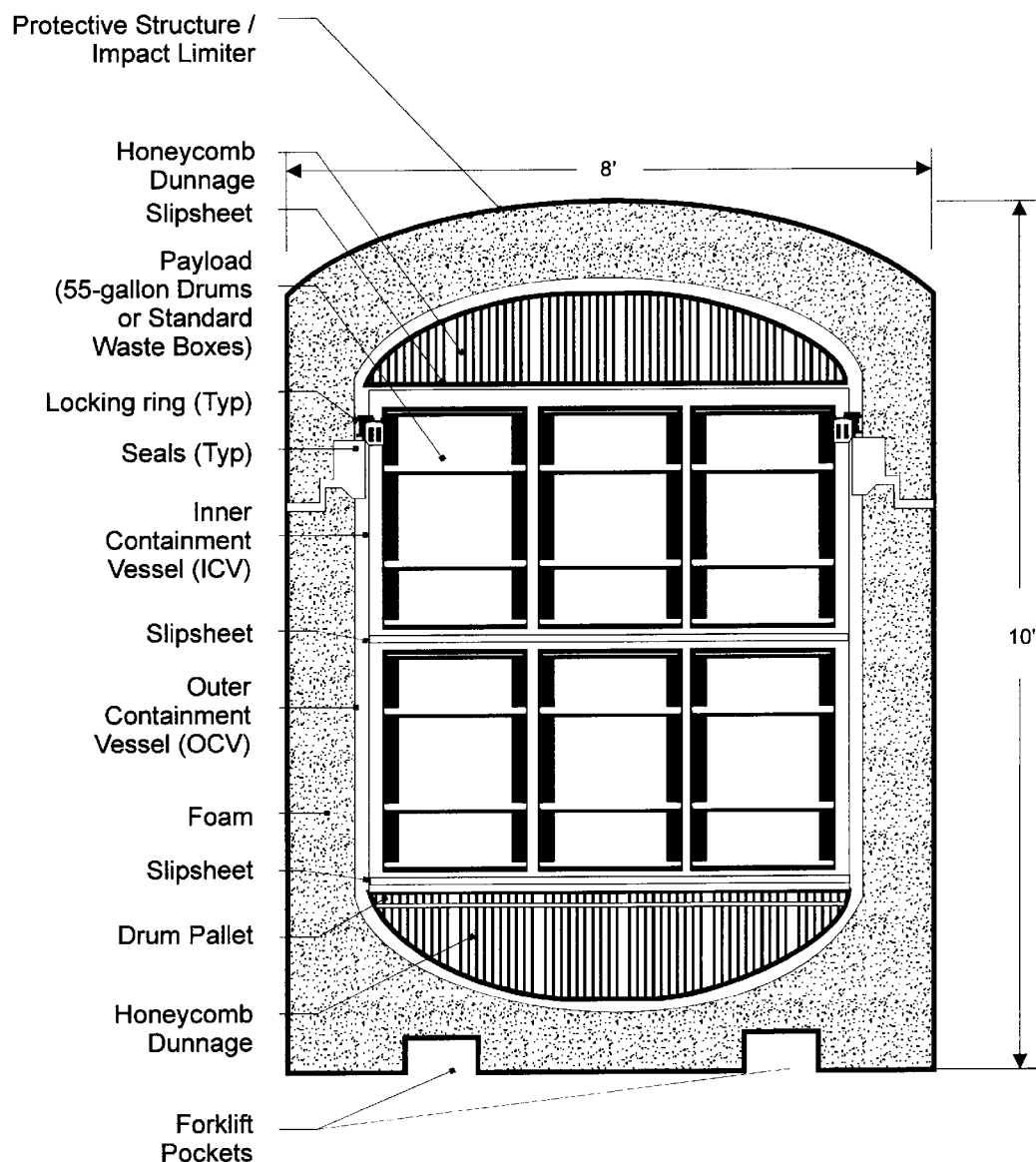


Figure M1-8a  
TRUPACT-II Shipping Container for CH Transuranic Mixed Waste (Schematic)



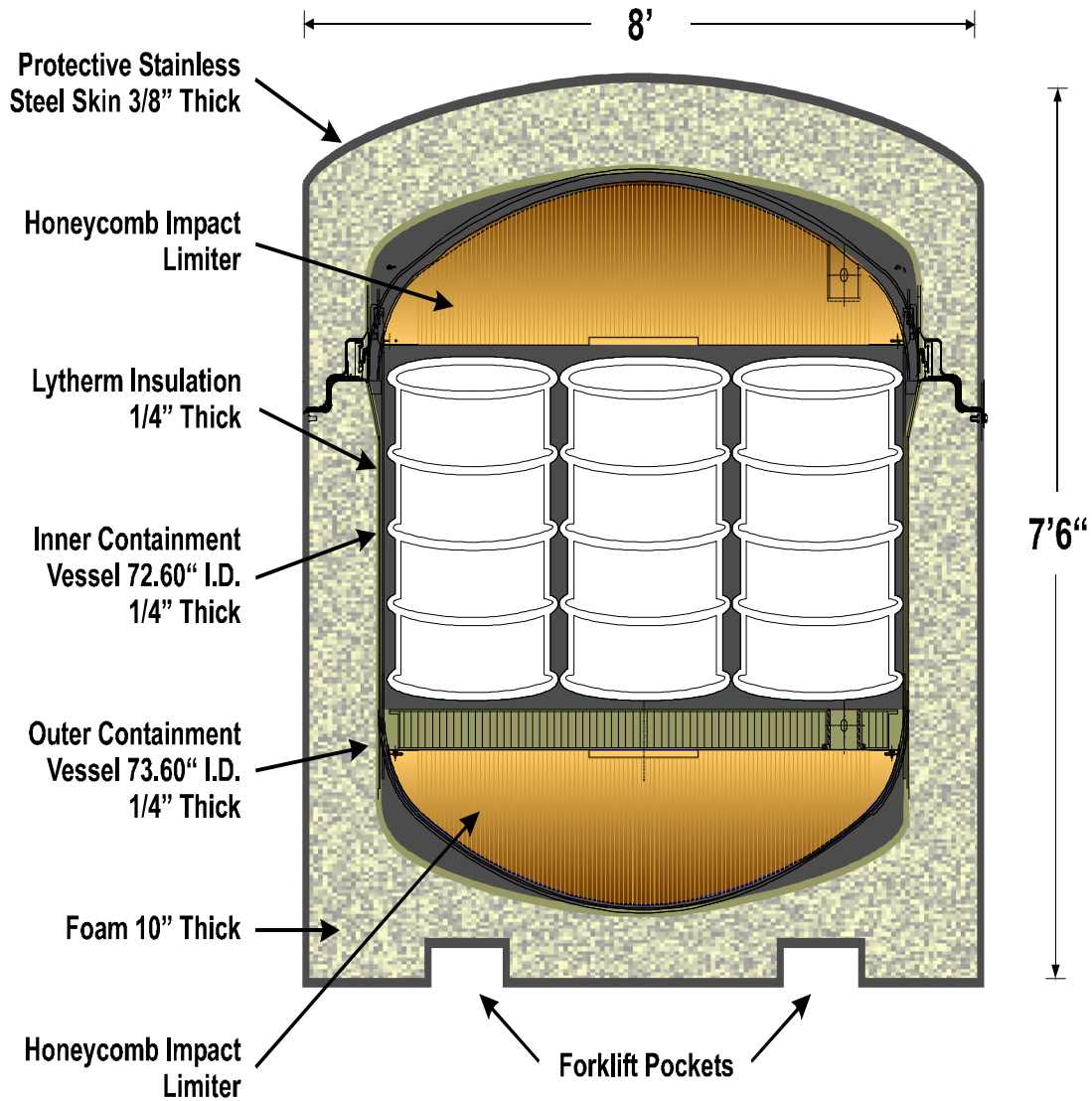


Figure M1-8b  
Typical HalfPACT Shipping Container for CH Transuranic Mixed Waste  
(Schematic)

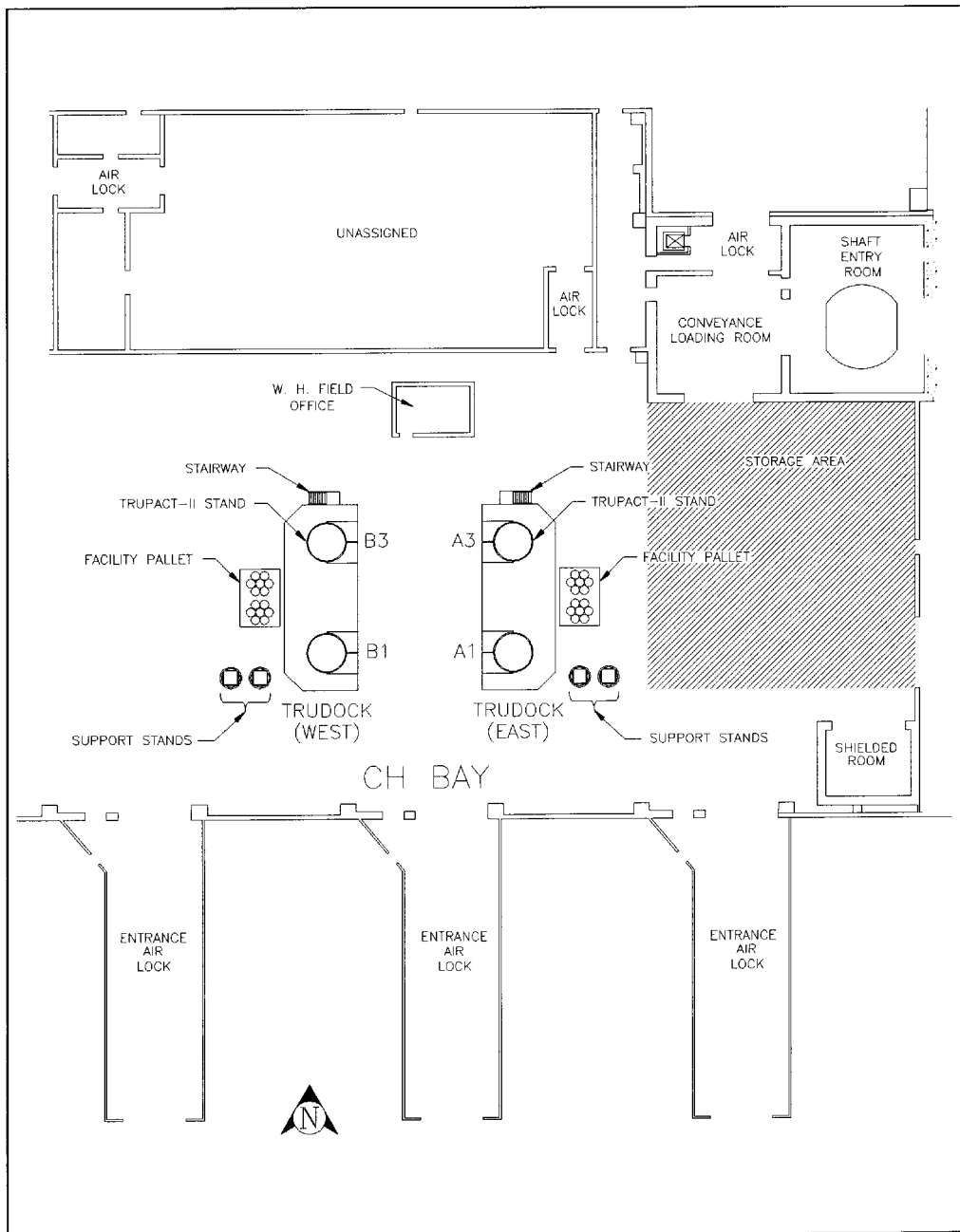


Figure M1-9  
Configuration of Contact-Handled Transuranic Mixed Waste Unloading Docks in the Waste Handling Building

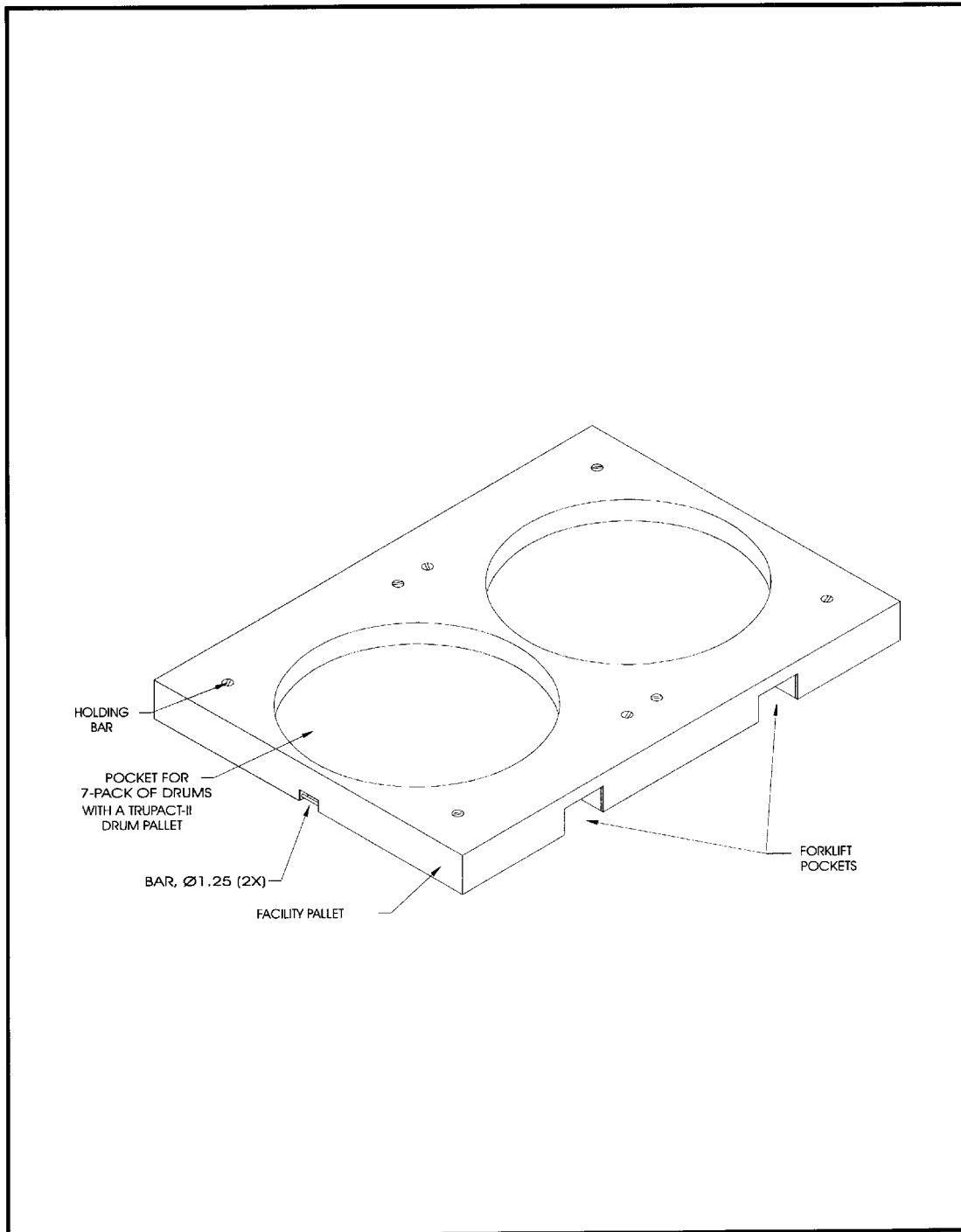


Figure M1-10  
Facility Pallet for Seven-Pack of Drums

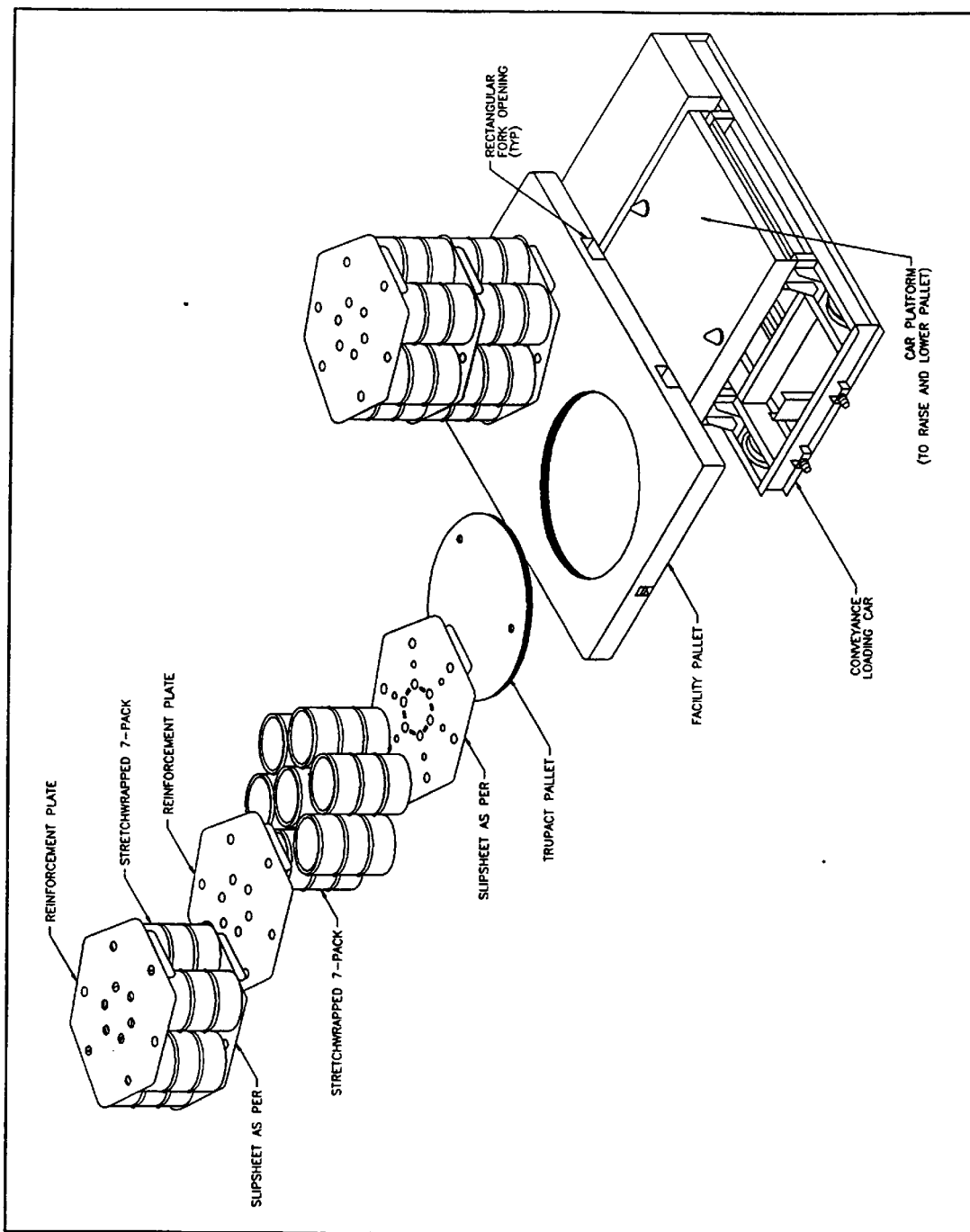


Figure M1-11  
Facility Transfer Vehicle (Example) with Seven-Packs and Facility Pallet

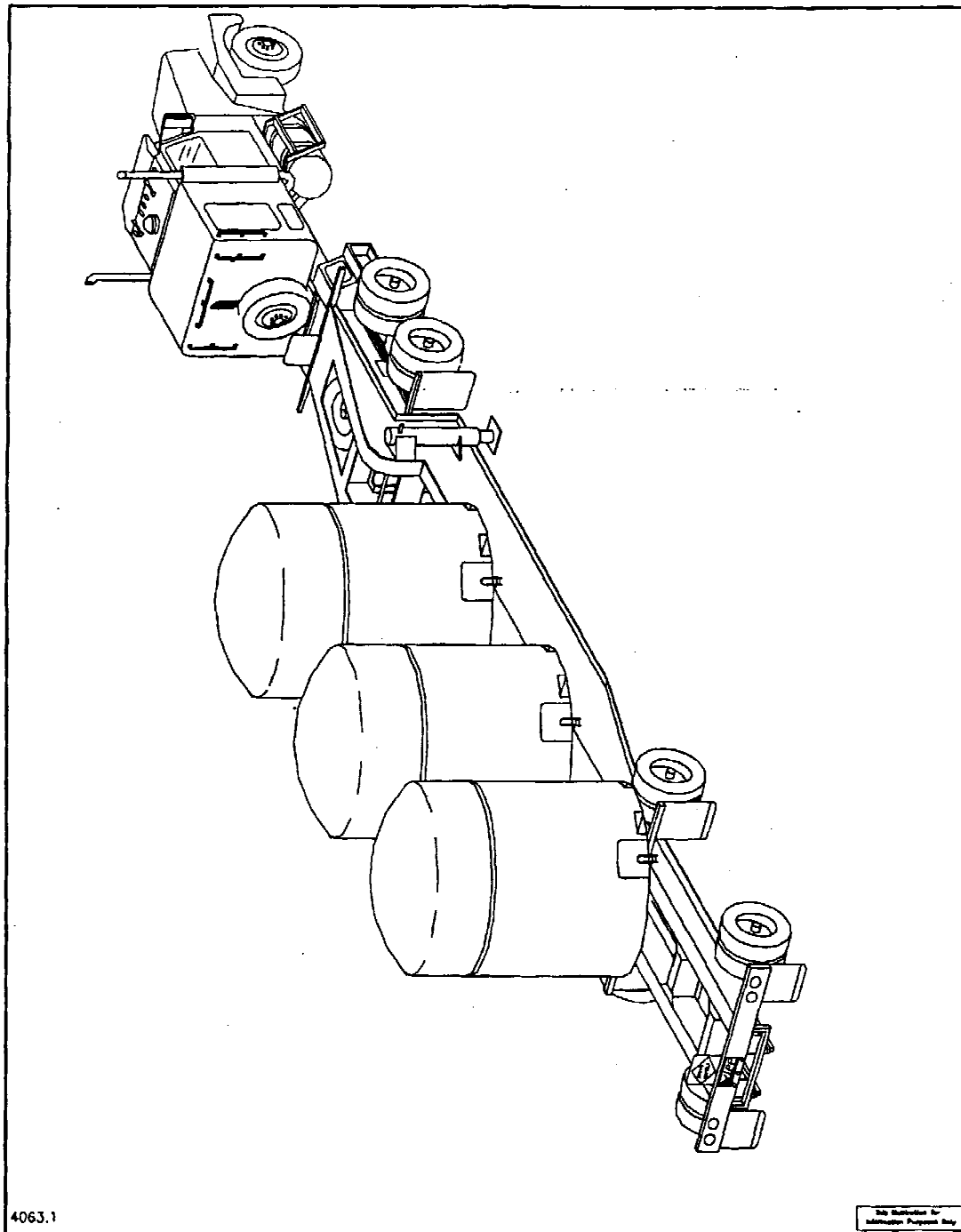


Figure M1-12  
TRUPACT-II Containers on Trailer

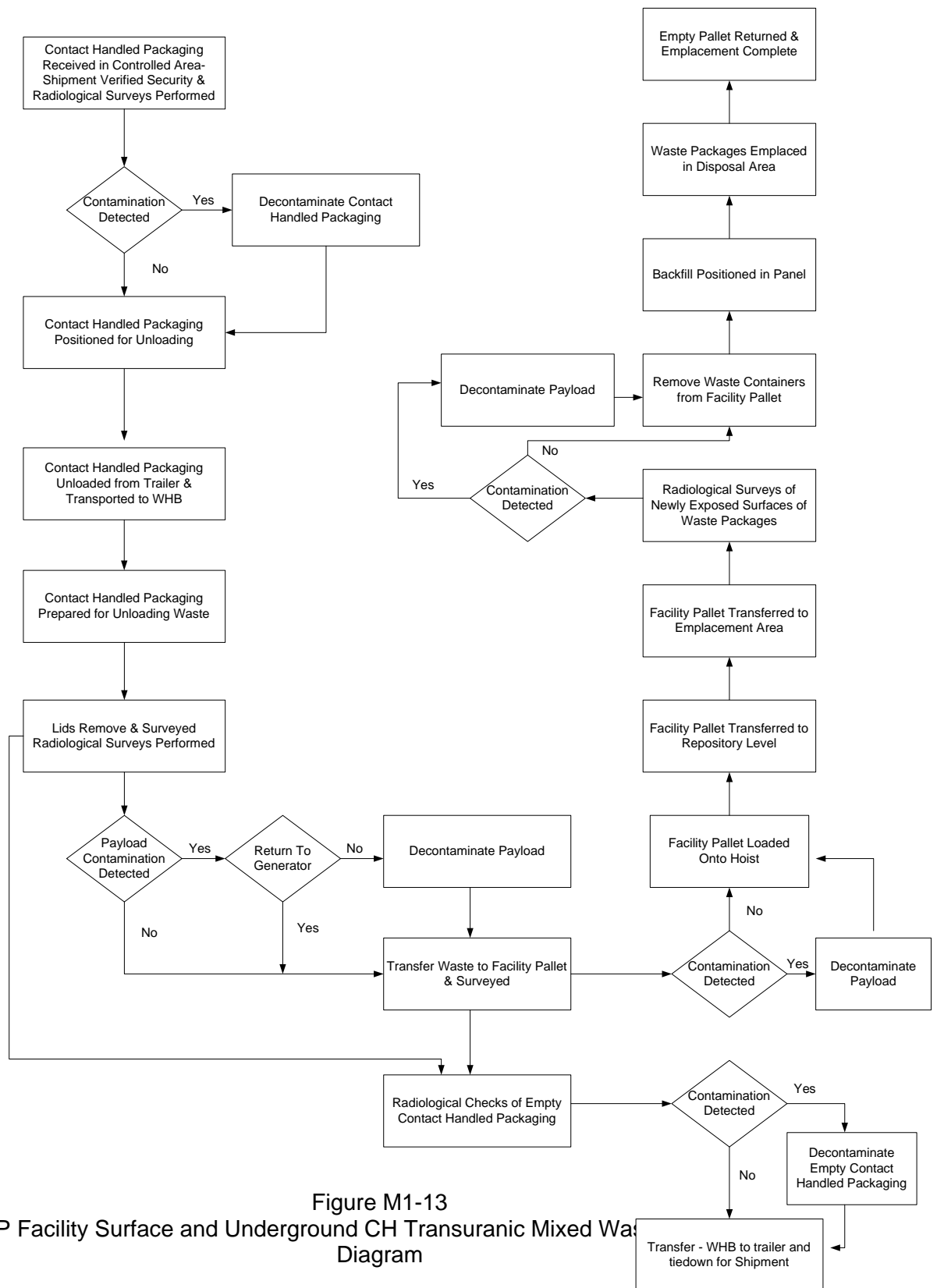


Figure M1-13  
WIPP Facility Surface and Underground CH Transuranic Mixed Waste  
Diagram

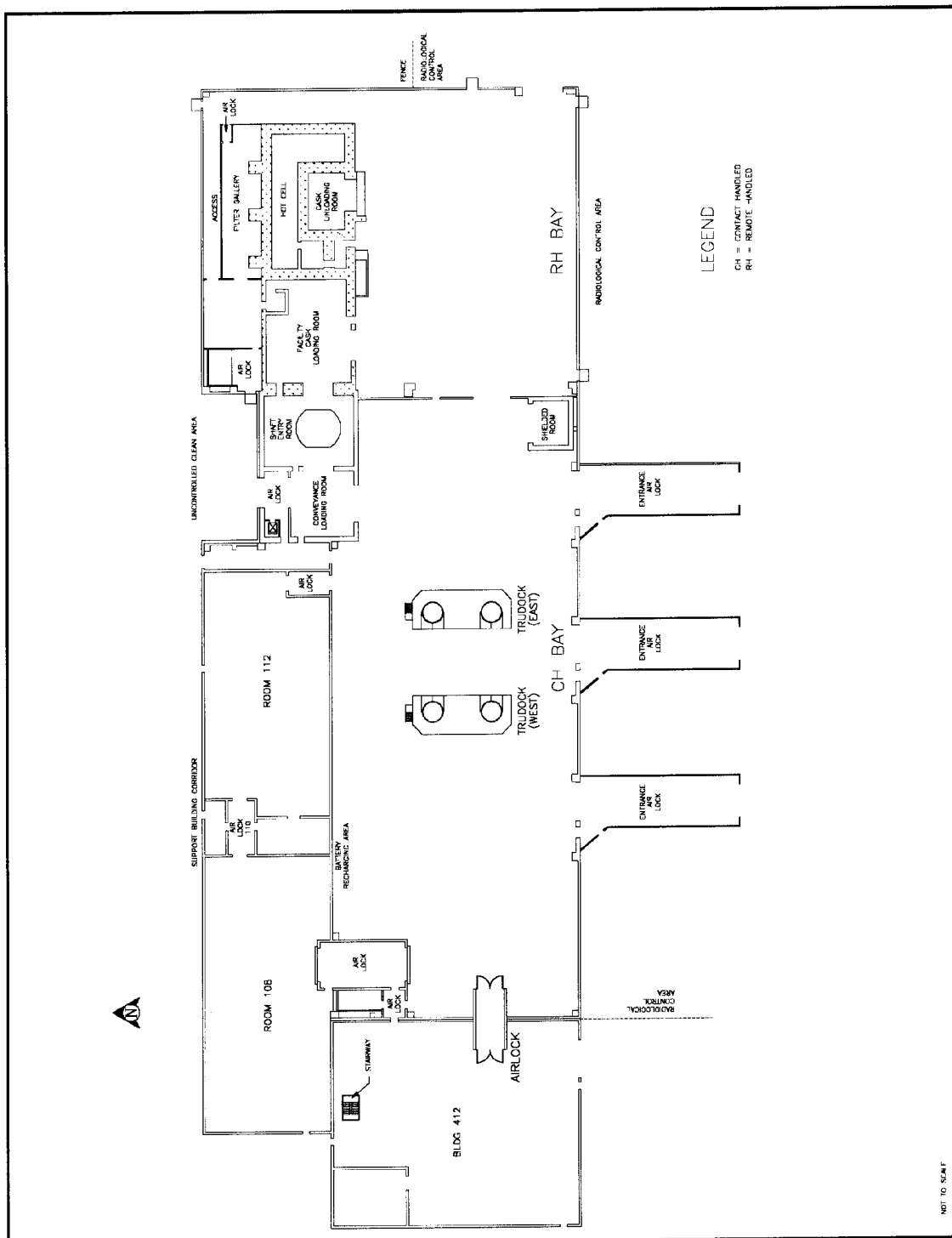


Figure M1-14  
Waste Handling Building Plan (Ground Floor)

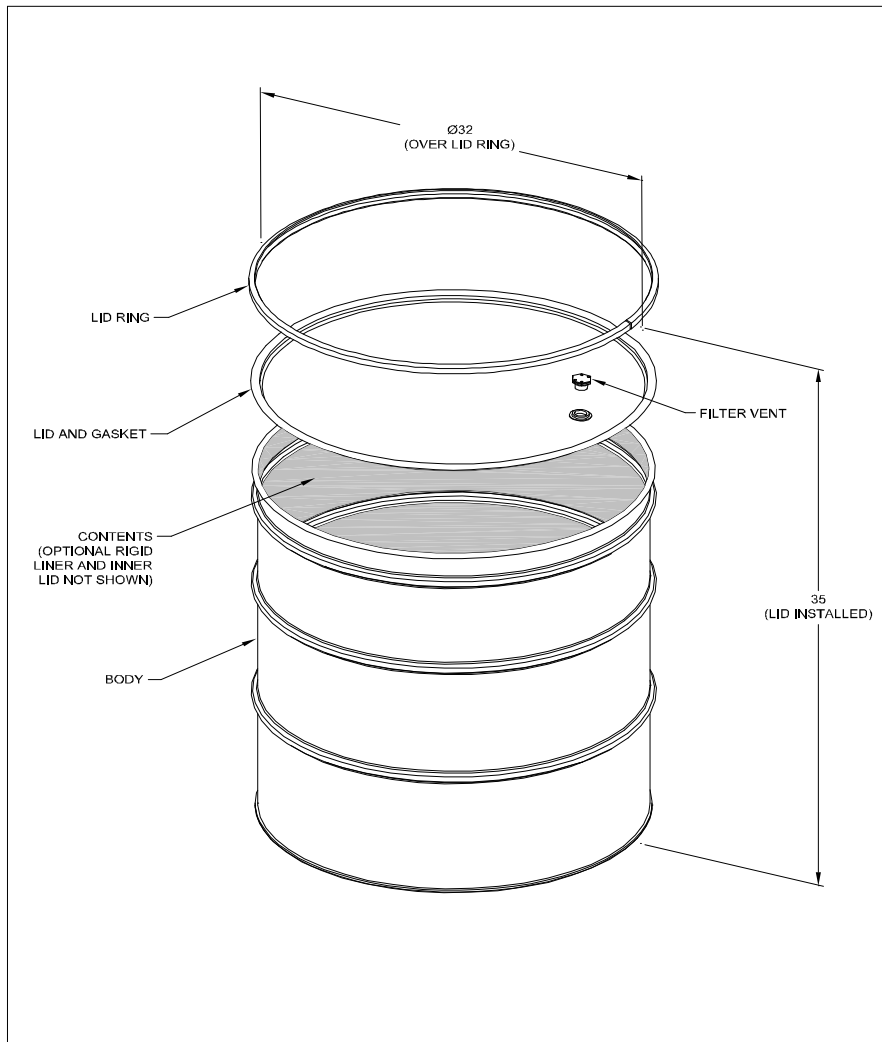


Figure M1-15  
100-Gallon Drum